Sun StorEdge™ 6130 Array Getting Started Guide

Installation and Configuration

Sun Microsystems, Inc.
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Preface

The *Sun StorEdge 6130 Array Getting Started Guide* is a combined installation, initial configuration, and getting started guide for the Sun StorEdge 6130 array. This guide describes how to install rackmounting rails, array modules, and management and configuration software.

Before You Read This Book

Before you begin to install the Sun StorEdge 6130 array, you must have already prepared the site as described in these books:

- *Sun StorEdge 6130 Array Regulatory and Safety Compliance Manual*
- *Sun StorEdge 6130 Array Site Preparation Guide*

How This Book Is Organized

Chapter 1 provides an overview of the Sun StorEdge 6130 array, management software, and installation process.

Chapter 2 describes how to install rackmounting rails, controller modules, and expansion cabinets in three Sun cabinets.

Chapter 3 describes tray power-on procedures.

Chapter 4 describes how to connect the management host and data hosts to enable access to the array.

Chapter 5 describes how to install the management software from CD.

Chapter 6 describes initial setup procedures for the management software.

Chapter 7 describes how to install the data host software.

Chapter 8 describes how to install the remote CLI client software.

Chapter 9 introduces you to the software and provides information for planning your storage configuration.

Appendix A provides worksheets to help you gather the information you need to complete the installation.

Appendix B describes how to set up a DHCP server.

Using UNIX Commands

This document does not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. Refer to the following for this information:

- Software documentation that you received with your system
- Solaris™ Operating System documentation, which is at `http://docs.sun.com`

Shell Prompts

Shell	Prompt
C shell	*machine-name*%
C shell superuser	*machine-name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Typographic Conventions

Typeface*	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output.	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
AaBbCc123	What you type, when contrasted with on-screen computer output.	`% su` `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this. To delete a file, type `rm` *filename*.

* The settings on your browser might differ from these settings.

Related Documentation

Application	Title	Part Number
Site planning information	*Sun StorEdge 6130 Array Site Preparation Guide*	819-0033-*nn*
Regulatory and safety information	*Sun StorEdge 6130 Array Regulatory and Safety Compliance Manual*	819-0035-*nn*
Late-breaking information not included in the information set	*Sun StorEdge 6130 Array Release Notes*	819-0034-*nn*
Late-breaking information not included in the StorADE information set	*Storage Automated Diagnostic Environment Enterprise Edition Release Notes*	819-0432-*nn*
Instructions for installing the Sun StorEdge Expansion cabinet	*Sun StorEdge Expansion Cabinet Installation and Service Manual*	805-3067-*nn*
Instructions for installing the Sun Rack 900/1000 cabinets	*Sun Rack Installation Guide*	816-6386-*nn*
Instructions for installing the Sun Fire cabinet	*Sun Fire Cabinet Installation and Reference Manual*	806-2942-*nn*

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Sun StorEdge 6130 Array Getting Started Guide, part number 819-0032-11

CHAPTER 1

Overview

This chapter provides an overview of the Sun StorEdge 6130 array. It contains the following sections:

- "Product Overview" on page 1
- "Overview of the Installation Process" on page 13

Product Overview

The Sun StorEdge 6130 array is a high-performance, enterprise-class, full 2 Gigabit per second (Gb/s) Fibre Channel solution that combines outstanding performance with the highest reliability, availability, flexibility, and manageability.

The Sun StorEdge 6130 array is modular, rackmountable and scalable from a single controller tray (1x1) configuration to a maximum configuration of 1x8 with seven additional expansion modules behind one controller tray (FIGURE 1-1).

This section contains an overview of the Sun StorEdge 6130 array hardware and software.

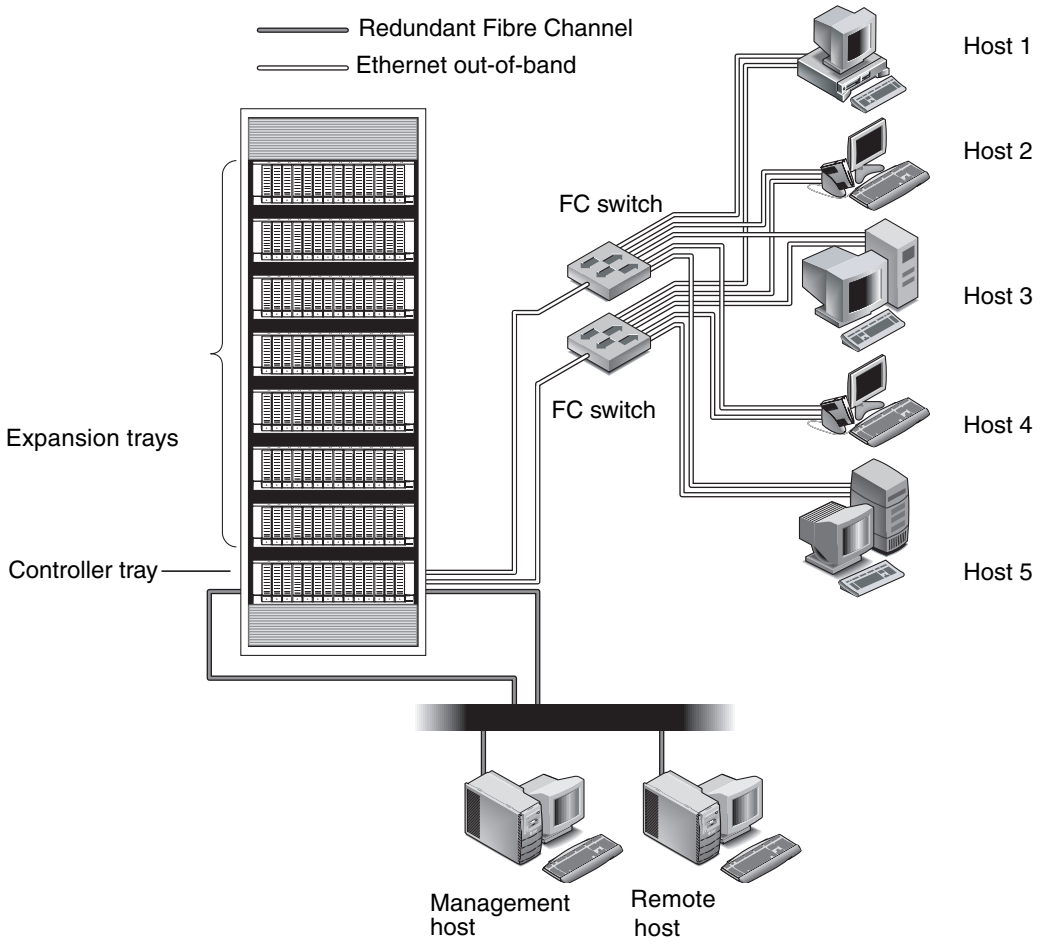


FIGURE 1-1 Sun StorEdge 6130 Array Product Overview

Hardware Overview

The Sun StorEdge 6130 array is a modular storage device that can scale from one controller tray to an array with a maximum of eight modules, consisting of one controller tray and seven expansion modules. Each controller or expansion tray can contain 5 to 14 disk drives per tray. The StorEdge 6130 arrays can be installed in the Sun StorEdge Expansion, Sun Fire System, and Sun Rack 900 /1000 cabinets, as well as in a third-party Telco 2-post or 4-post rack.

This section describes the main components of the Sun StorEdge 6130 array controller and expansion trays.

Controller Tray

A controller tray contains two RAID controllers, which operate independently and provide failover capability for the management path. The controller tray is configured for Fibre Channel (FC) disk drives and provides RAID functionality, caching, and disk storage.

TABLE 1-1 describes the controller tray configuration.

TABLE 1-1 Sun StorEdge 6130 Array Controller Tray

Description	Quantity
FC RAID controllers	2
FC 3.5-inch drives	5 - 14 per tray
FC hard disk drives: 73G10K, 73G15K, 146G10K	
Ethernet ports for management host connections	2 (1 per controller)
2-Gbps FC host ports with SFPs	4 (2 per controller)
2-Gbps FC expansion ports	2 (1 per controller)
Power supplies	2
Fan assemblies	2

FIGURE 1-2 shows the components and indicators on the front of the controller tray.

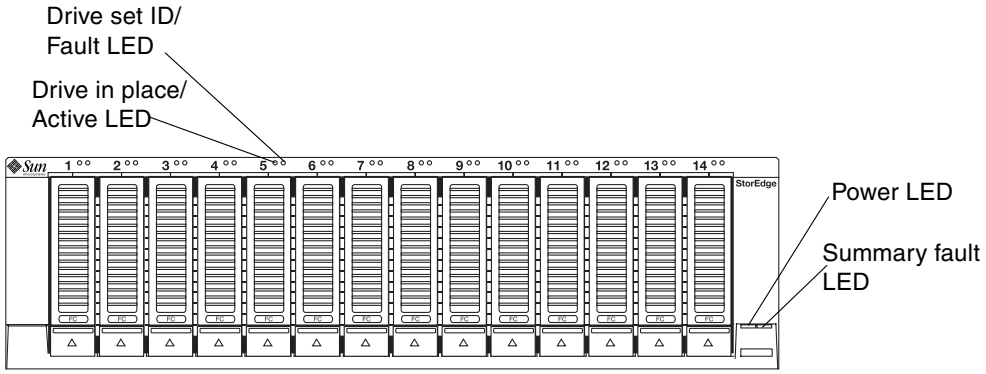


FIGURE 1-2 Controller Tray (Front View)

TABLE 1-2 describes the LEDs and switches on the front of the controller tray.

TABLE 1-2 Controller Tray LEDs and Switches (Front)

LED/Switch	Description
Drive set ID/Fault LED	This LED is steady amber to indicate a drive fault and blinks amber to indicate drive position identification.
Drive in place/Active LED	This LED is steady green for each drive that is in place and blinks green to indicate disk activity.
Power LED	This LED is steady green when at least one power supply is installed and functional.
Summary fault LED	This LED is amber when a tray level fault occurs.

FIGURE 1-3 shows the ports and switches at the back of the controller tray. You will use these during the installation procedure.

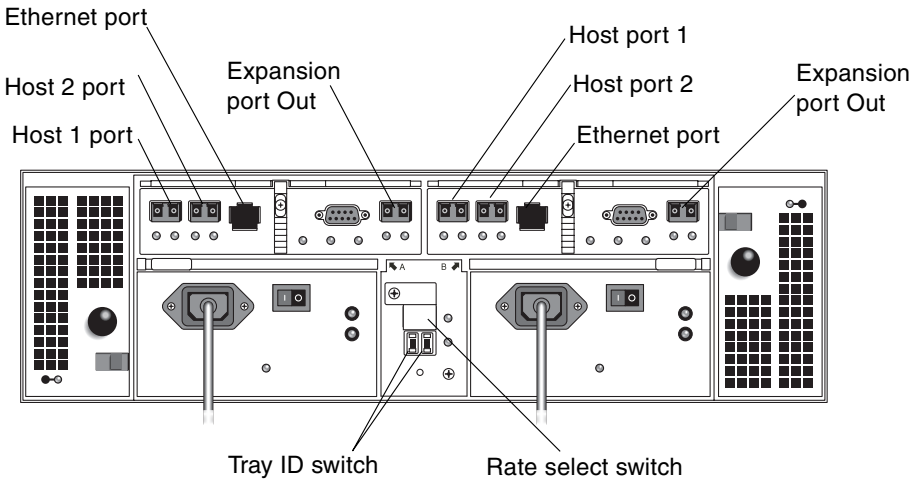


FIGURE 1-3 Controller Tray Ports and Switches (Back View)

TABLE 1-3 describes the ports and switches on the back of the controller tray.

TABLE 1-3 Controller Tray Ports and Switches (Back)

Ports/Switches/LEDs	Description
Host 1 and 2 ports	2-Gbit FC Small Form-factor Plug-in (SFP) ports used to connect to data hosts.
Ethernet ports	RJ-45 Ethernet port used for out-of-band management of the RAID controller. An internal Ethernet device provides standard 10 Mbits/second and 100 Mbits/second full-duplex connectivity.
Expansion ports (Out)	2-Gbit FC ports used to connect to the drive channel device and expansion modules.
Tray ID switch	A pair of rotary switches used to select the array's tray number. One switch sets the tens place, and the other sets the ones place.
Rate select switch	A toggle switch used to set the transfer rate of the FC disk drive loop to 1 Gbit/second or 2 Gbits/second.

FIGURE 1-4 shows the LEDs at the back of the controller tray. You will also use these during the installation procedure.

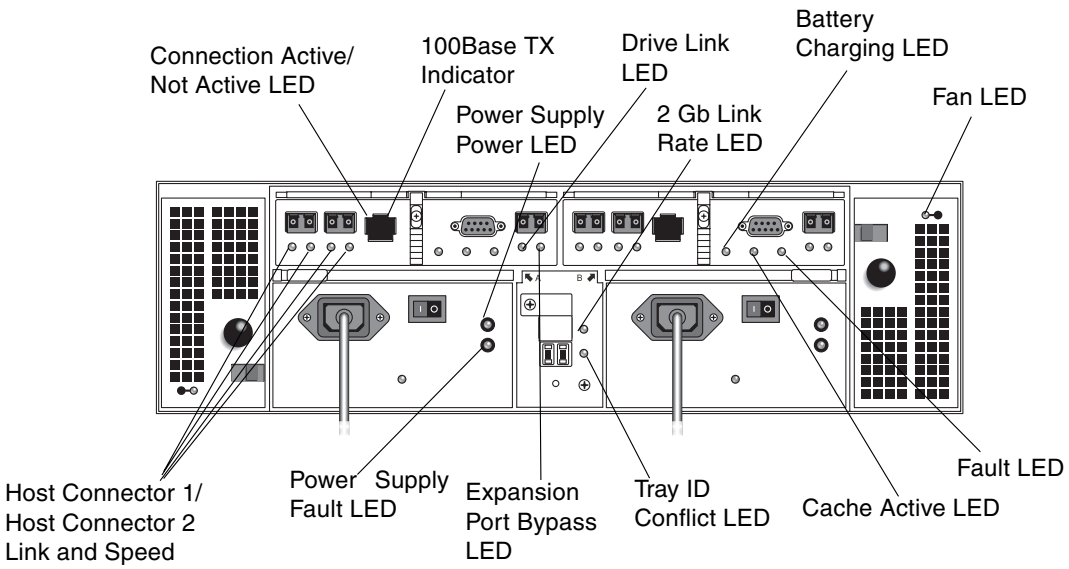


FIGURE 1-4 Controller Tray LEDs (Back View)

TABLE 1-4 describes the LEDs on the back of the controller tray.

TABLE 1-4 Controller Tray LEDs (Back)

LED	State/Color	Cause and Action
Connection Active/ Not Active LED (on Ethernet connector)	On/Green	There is an active connection. No action is needed.
	Off	No active connection. Ensure that you have two active connections to the controller module.
100BaseTX Indicator (on Ethernet connector)	On/Green	100BaseTX connection. No action is needed.
	Off	10BaseT connection, if Connection Active/Not Active LED is on. No action is needed.
Host Connector 1/ Host Connector 2 Link LEDs	On/Green	Host connection is functioning normally. No action is needed.
	Off	No host is attached, or a problem is detected. If a host is attached, check logs for errors.
Host Connector 1/ Host Connector 2 Speed LEDs	On/Green	2 Gb/s data rate from the host is detected. No action is needed.
	Off	1 Gb/s data rate from the host is detected. To change the rate, refer to "Checking the Link Rate LED" on page 69.
Power Supply Power LED	On/Green	The module is receiving power. No action is needed.
	Off	The module is not receiving power. Check the status of the Power Supply Fault LED.
Power Supply Fault LED	On/Amber	There is a problem with the power supply. Check logs for errors.

TABLE 1-4 Controller Tray LEDs (Back) *(Continued)*

LED	State/Color	Cause and Action
	Off	Power is off, or power supply is functioning normally. No action is needed.
Drive Link LED	On/Green	Drive link is functioning normally. No action is needed.
	Off	A problem is detected inside the internal drive loop of the controller module. Check logs for errors.
Expansion Port Bypass LED	On/Amber	There are no expansion trays present. If expansion trays are present, a loop problem exists between the expansion and controller trays.
	Off	Normal state. No action is needed.
2 Gb Link Rate LED	On/Green	The FC loop rate between trays is 2 Gb/s.
	Off	The FC disk drive loops are operating at 1 Gb/s. Set the link rate to 2 Gb/s as described in "Checking the Link Rate LED" on page 69.
Tray ID Conflict LED	On/Amber	Two or more trays have the same ID. Check for other amber LEDs and set correctly.
	Off	No action is needed.
Battery Charging/ Charged LED	On/Green	Battery is charged. No action is needed.
	Blinking/Green	Battery is charging. No action is needed.
	Off	There is a problem with the battery. Check logs for errors.
Cache Active LED	On/Green	Cache is in use. There is data in the cache that has not yet been written to disk. No action is needed.
	Off	There is no data in the write cache.
Fan LED	On/Amber	There is a problem with the fan. Check logs for errors.

TABLE 1-4 Controller Tray LEDs (Back) *(Continued)*

LED	State/Color	Cause and Action
	Off	No action is needed.
Fault LED	On/Amber	Indicates a general fault. Check the states of other LEDs that indicate a fault. For example, if the Fan LED is on and amber, then the Fault LED should be on, too. Also check logs for errors.
	Off	Power is off, or module is functioning normally. No action is needed.

Expansion Tray

The expansion tray provides from 5 to 14 additional FC or Serial Advanced Technology Attachment (SATA) drives. An expansion tray is cabled directly to a controller tray and cannot operate independently.

You cannot mix FC and SATA disk drives within the same expansion tray. All drives within a single expansion tray must be the same type, either all FC drives or all SATA drives.

TABLE 1-5 describes the expansion tray components.

TABLE 1-5 Sun StorEdge 6130 Array Expansion Tray

Description		Quantity
FC or SATA 3.5-inch drives	FC hard disk drives: 73G10K, 73G15K, 146G10K SATA hard disk drives: 400G7.2	5 - 14
I/O tray with In and Out expansion ports		2
Power supplies		2
Fan assemblies		2

TABLE 1-6 describes the expansion tray LEDs.

TABLE 1-6 Expansion Tray LEDs (Back)

LED	State/Color	Cause and Action
Bypass In LED	On/Amber	No cable is connected.
	Off	Cable is connected.
Power LED	On/Green	The module is receiving power. No action is needed.
	Off	The module is not receiving power.
Fault LED	On/Amber	Indicates a general fault. Check the states of other LEDs that indicate a fault. For example, if the Fan LED is on and amber, then the Fault LED should be on, too. Also check logs for errors.
	Off	Power is off, or module is functioning normally. No action is needed.
Over Temp LED	On/Amber	Indicates an overheating problem.
	Off	Module is functioning normally. No action is required.
Bypass Out LED	On/Amber	No cable is connected.
	Off	Cable is connected.
Fan LED	On/Amber	There is a problem with the fan. Check logs for errors.
	Off	No action is needed.
Power Supply Power LED	On/Green	The module is receiving power. No action is needed.
	Off	The module is not receiving power. Check the status of the Power Supply Fault LED.
Power Supply Fault LED	On/Amber	There is a problem with the power supply. Check logs for errors.
	Off	Power is off, or power supply is functioning normally. No action is needed.

FIGURE 1-5 shows the front and back views of the expansion tray LEDs for a SATA drive. FIGURE 1-6 shows the front and back views of the expansion tray LEDs for an FC drive.

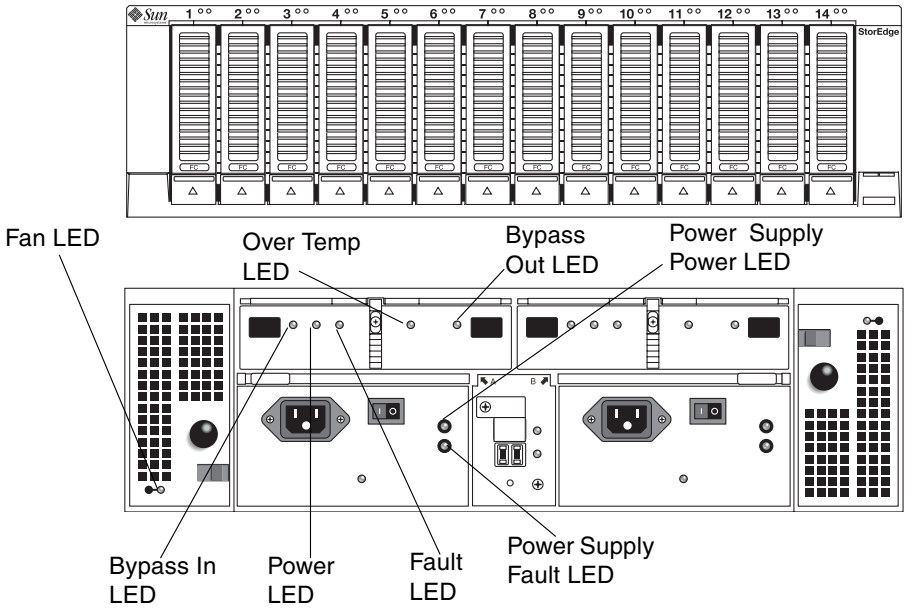


FIGURE 1-5 SATA Expansion Tray (Front and Back Views))

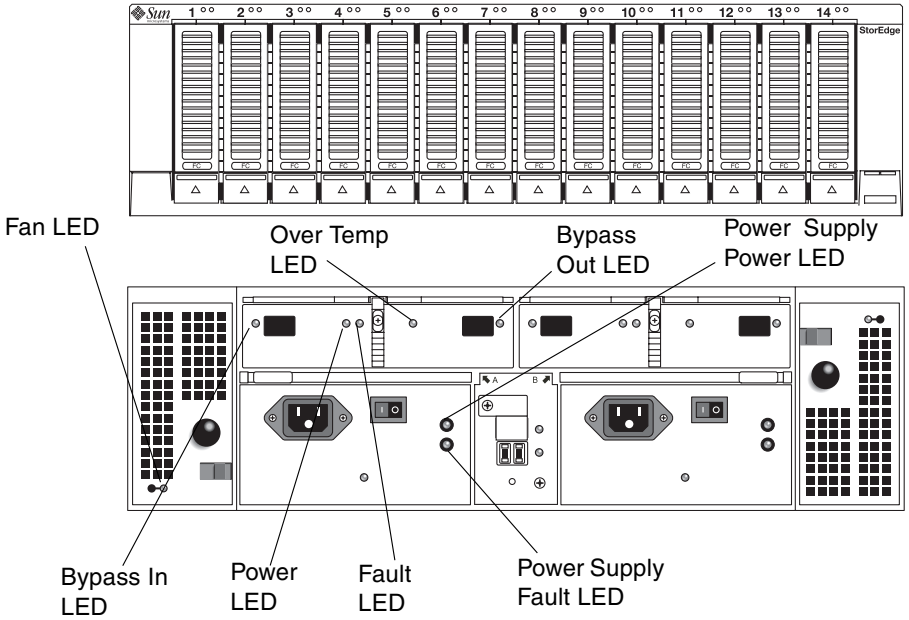


FIGURE 1-6 FC Expansion Tray (Front and Back Views)

Software Overview

The Sun StorEdge 6130 array software is delivered on CD and consists of the tools described in the following topics:

- "Management Software" on page 12
- "Remote CLI Client" on page 12
- "Monitoring and Diagnostic Software" on page 12
- "Data Host Software" on page 12

You specify the functionality you require, and the CD installs the necessary software.

Management Software

The Sun StorEdge 6130 array web-based management software is the primary interface for configuring and managing the array. The management software consists of a suite of tools that you install on an external management host, including the command line interface (CLI). The management host must be a Sun workstation running the Solaris 8, 9, and 10 Operating System (OS).

The management software enables the storage administrator to manage the Sun StorEdge 6130 array from any system with a web browser that is on the same network as the management host. For a list of supported browsers, see the *Sun StorEdge 6130 Array Release Notes*.

Remote CLI Client

You can also manage and configure storage for the Sun StorEdge 6130 array using the remote CLI client. The CLI provides the same control and monitoring capability as the web browser, and it is also scriptable for running frequently performed tasks.

The remote CLI client is available for Solaris OS and several other operating systems. See the *Sun StorEdge 6130 Array Release Notes* for a list of supported operating system platforms. For more information about the CLI commands, see the `sscs` man page.

Monitoring and Diagnostic Software

The Sun Storage Automated Diagnostic Environment (StorADE) is a monitoring and diagnostic tool for the array. You can configure the software to monitor on a 24-hour basis, collecting information that enhances the reliability, availability, and serviceability (RAS) of the Sun StorEdge 6130 array. For additional information, see the *Storage Automated Diagnostic Environment Enterprise Edition Release Notes*.

The monitoring and diagnostic software can be accessed from a web browser or from the command line.

Data Host Software

The Sun StorEdge 6130 array data host software controls the data path between the data host and the array. The data host software consists of the following tools:

- Sun StorEdge SAN Foundation Kit (SFK) for managing the data path I/O connections between data hosts and the array. This software includes drivers and utilities that enable Solaris data hosts to connect to, monitor, and transfer data in a SAN. (Note that the SFK is embedded in Solaris 10).

- Sun StorEdge Traffic Manager software, which provides multipathing functionality and the ability to reliably communicate with the array's storage.

Data host software enables Solaris 8, 9, and 10 workstations and other operating system platforms to communicate with the Sun StorEdge 6130 array. For a list of supported operating system platforms, see the *Sun StorEdge 6130 Array Release Notes*.

Data host software for Solaris is distributed on the Sun StorEdge 6130 Host Installation Software CD. See Chapter 7 for information about how to obtain the software for other operating systems from Sun's Download Center.

Overview of the Installation Process

Before you begin to install the array, you must do the following:

- Read the *Sun StorEdge 6130 Array Release Notes* for any late-breaking information related to the installation of the array.
- Prepare the site as described in these books:
  - *Sun StorEdge 6130 Array Regulatory and Safety Compliance Manual*
  - *Sun StorEdge 6130 Array Site Preparation Guide*

You can download the Sun StorEdge documentation from:

`http://www.sun.com/products-n-solutions/hardware/docs/Network Storage Solutions/Midrange/6130/index.html`

The following checklist (TABLE 1-7) outlines all of the tasks required for installing the Sun StorEdge 6130 array hardware and software and tells you where you can find detailed procedures. To ensure a successful installation, perform the tasks in the order in which they are presented.

TABLE 1-7 Sun StorEdge 6130 Array Installation Checklist

Step	Installation Task	Where to Find Procedure
1.	Unpack the cabinet and move it into position.	Unpacking guide attached to the outside of the shipping carton
2.	Install and secure the cabinet.	*Sun StorEdge Expansion Cabinet Installation and Service Manual*, *Sun Rack Installation Guide*, or *Sun Fire Cabinet Installation and Reference Manual*
3.	Unpack the rackmounting kit and check its contents.	"Preparing the Rackmount Kit" on page 18

TABLE 1-7 Sun StorEdge 6130 Array Installation Checklist *(Continued)*

Step	Installation Task	Where to Find Procedure
4.	Unpack the tray box and check its contents.	"Preparing the Tray" on page 19
5.	Prepare the cabinet for installation.	"Preparing the Cabinet" on page 20
6.	Attach the rails to the cabinet or Telco rack.	"Attaching the Rails to the Sun StorEdge Expansion or Sun Fire Cabinet" on page 22, "Attaching the Rails to the Sun Rack 900/1000 Cabinet" on page 28, "Attaching the Rails to a Telco 2-Post Rack" on page 40, or "Attaching the Rails to a Telco 4-Post Rack" on page 44
7.	Mount the controller tray and expansion trays in the cabinet or Telco rack.	"Installing a Tray in a Cabinet" on page 34, or "Installing a Tray in a Telco Rack" on page 48
8.	Attach the power cables.	"Connecting the Power Cables" on page 58
9.	Set the tray ID.	"Setting the Tray ID" on page 58
10.	Cable the controller tray and expansion trays.	"Intertray Cabling" on page 60
11.	Turn on the power and check the link rate.	"Powering On Trays" on page 68
12.	Connect the management host.	"Connecting the Management Host" on page 73
13.	Attach the host interface cables.	"Connecting Data Hosts" on page 74
14.	Install the management software.	"Running the Installation Script" on page 80
15.	Configure the controller tray IP addresses.	"Configuring the IP Address of the Array Controllers" on page 84
16.	Start and log in to the management software.	"Starting the Management Software" on page 93
17.	Set initial array settings.	"Setting Up the Management Software" on page 102
18.	Set initial Storage Automated Diagnostic Environment settings.	"Setting Up the Sun Storage Automated Diagnostic Environment" on page 108
19.	Connect Sun Remote Services Net Connect.	"Connecting Sun SRS Net Connect 3.1" on page 112

TABLE 1-7 Sun StorEdge 6130 Array Installation Checklist *(Continued)*

Step	Installation Task	Where to Find Procedure
20.	Install the data host software.	"Installing Data Host Software" on page 113
21.	Install the remote CLI software.	"Installing Remote Management Software" on page 121
22.	Start to configure your storage.	"Planning Your Storage Configuration" on page 125

CHAPTER 2

Installing Trays

Use the procedures in this chapter to install trays in a cabinet or Telco rack. The number of trays you need to install depends on your overall storage requirements. You can install a maximum of eight, one controller tray and up to seven expansion trays, in a Sun cabinet or third-party Telco rack.

This chapter describes the process of installing Sun StorEdge 6130 trays. It contains the following sections:

- "Preparing for the Installation" on page 18
- "Attaching the Rails to a Cabinet" on page 21
- "Installing a Tray in a Cabinet" on page 34
- "Attaching the Rails to a Telco Rack" on page 39
- "Installing a Tray in a Telco Rack" on page 48
- "Connecting the Power Cables" on page 58
- "Setting the Tray ID" on page 58
- "Intertray Cabling" on page 60
- "Next Steps" on page 66

The installation procedures in this chapter require the following items:

- #2 Phillips screwdriver
- #3 Phillips screwdriver
- Antistatic protection

Caution – Electrostatic discharge can damage sensitive components. Touching the array or its components without using a proper ground might damage the equipment. To avoid damage, use proper antistatic protection before handling any components.

Preparing for the Installation

Use the following procedures to prepare for installation:

- "Preparing the Rackmount Kit" on page 18
- "Preparing the Tray" on page 19
- "Preparing the Cabinet" on page 20
- "Preparing the Telco Rack" on page 20

Preparing the Rackmount Kit

Unpack the rackmount kit and check the contents. The contents will vary, depending upon whether you ordered a kit for a cabinet installation or a Telco rack installation.

Cabinet Installation

With a cabinet installation, the CAM100 3RU rail kit contains the following items:

- Left front (P/N 341-04443-01) and back (P/N 341-0444) rails
- Right front (P/N 341-04445-01) and back (P/N 341-0446) rails
- Mounting hardware as listed below:

Quantity	Type	Used With
8	8-32 (small) panhead screw	All Sun cabinets
8	10-32 (medium) panhead screw	Sun StorEdge Expansion cabinet or Sun Fire cabinet
12	Metric M6 (large) panhead screw	Sun Rack 900/1000 cabinet

Note – The kit may have extra screws.

The rails can be adjusted to fit the following Sun cabinets:

- Sun StorEdge Expansion cabinet
- Sun Fire cabinet
- Sun Rack 900/1000 cabinet

Telco Rack Installation

With a Telco rack installation, kits contain the following items:

Telco 2-post 3RU rail kit:

- Left rail (P/N 341-0532-01)
- Right rail (P/N 341-0533-01)
- Mounting hardware as listed below:

Quantity	Type
2	8-32 (small) panhead screw
4	10-32 (medium) panhead screw
12	12-24 (large) panhead screw

Telco 4-post 3RU rail kit:

- Left rail (P/N 341-0530-01)
- Right rail (P/N 341-0531-01)
- Mounting hardware as listed below:

Quantity	Type
2	8-32 (small) panhead screw
4	10-32 (medium) panhead screw
8	12-24 (large) panhead screw

Note – The kits may have extra screws.

Preparing the Tray

Caution – Two people are needed to lift and move the tray. Use care to avoid injury. An array can weigh up to 95 pounds (43 kg). Do not lift the front of the tray; this can cause damage to the drives.

1. **Unpack the tray.**
2. **Check the contents of the box for the following items:**
   - Sun StorEdge 6130 tray (controller or expansion)

- Ship kit for the controller tray
  - Two 5-meter optical Fibre Channel (FC) cables for connecting the RAID controllers to your Storage Area Network (SAN) or host
  - Two 6-meter RJ45 -RJ45 Ethernet cables
  - Sun StorEdge 6130 Host Installation Software CD
  - Sun StorEdge 6130 Array Rack Alignment Template
  - *Sun StorEdge 6130 Array Getting Started Guide*
  - *Sun StorEdge 6130 Array Installation Poster*
  - Documentation URL brochure
- Ship kit for the expansion tray
  - Two 2-meter copper FC cables
  - Documentation URL brochure

Preparing the Cabinet

Select the cabinet in which you will be installing the array. Be sure the cabinet is installed as described in the installation instructions provided with it.

1. **Stabilize the cabinet as described in the cabinet documentation.**
2. **If the cabinet has casters, make sure the casters are locked to prevent the cabinet from rolling.**
3. **Remove or open the top front panel.**
4. **Remove or open the vented back panel.**

Preparing the Telco Rack

Select the rack in which you will be installing the tray. The Telco mounting rails are designed to fit two types of racks:

- Telco 2-post 3-inch width “C” channel frame
- Telco 4-post 3-inch width “C” channel frame

Install the rack as described in the installation instructions provided by the manufacturer.

Note – Sun Microsystems makes no warranties or guaranties as to fit, form, or function of the Sun StorEdge 6130 array installed in third-party racks or cabinets. It is the customer's responsibility to ensure that the rack or cabinet can house the Sun StorEdge 6130 array in all conditions that may exist. All racks and cabinets must comply with local building and construction codes.

Planning the Order of the Tray Installation

Install the trays starting with the first controller tray at the bottom of the cabinet. Next install the expansion trays for the first controller tray. If room remains in the cabinet, repeat for the next controller and expansion trays.

Note – If you are installing a mixture of FC and SATA trays, be sure to install the SATA trays first, followed by the FC trays. Installing in this order allows you to install either a SATA or FC tray without having to take an outage.

When installing FC trays, you should also ensure that they are installed contiguously. For additional information, see the *Sun StorEdge 6130 Array 1.1 Release Notes*.

Starting at the bottom distributes the weight correctly in the cabinet.

Attaching the Rails to a Cabinet

Depending on the type of Sun cabinet you have, use one of the following procedures to attach the rails:

- Attaching the Rails to the Sun StorEdge Expansion or Sun Fire Cabinet
- Attaching the Rails to the Sun Rack 900/1000 Cabinet

Because this rail kit can be adapted for several cabinets, closely follow the procedures; they may require actions you have not previously taken.

Note – In this section, you will loosely hang the rails from screws you attach to the side walls, *before* connecting the rails to the front and back.

Attaching the Rails to the Sun StorEdge Expansion or Sun Fire Cabinet

The procedure for attaching the rails to the Sun StorEdge Expansion cabinet and Sun Fire cabinet are the same, with one exception. For the Sun Fire cabinet, the rail extensions are not required and the following procedure instructs you to remove the screws and the extension from each rail.

Note – All of the drawings show the Sun StorEdge Expansion cabinet.

---

1. **Depending on the type of cabinet you have, do one of the following:**
   - For the Sun StorEdge Expansion cabinet, use the #2 Phillips screwdriver to loosen the side-rail screws. Adjust each rail to its maximum length (FIGURE 2-1).

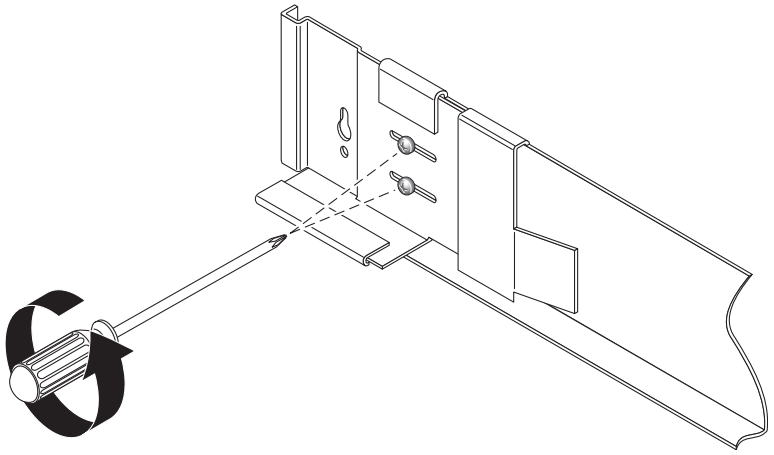


FIGURE 2-1 Loosening the Rail Screws to Adjust the Rail Length

- For the Sun Fire cabinet, use the #2 Phillips screwdriver to loosen and remove the side-rail screws. Remove the rail extension from the rail (FIGURE 2-2).

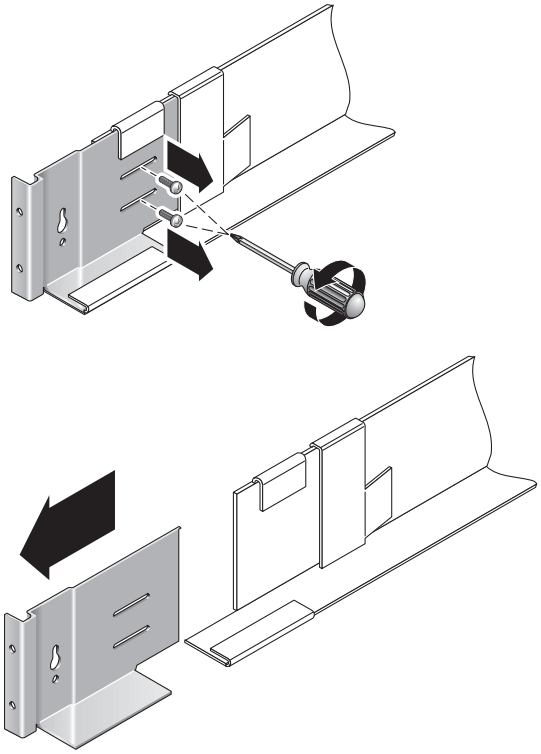


FIGURE 2-2 Removing the Rail Extension for the Sun Fire Cabinet

2. **Insert four 10-32 screws (two per side) in the front and back mounting holes of the cabinet (FIGURE 2-3). Do not tighten at this time. You will hang the side rails on these screws.**

   Use the numbered marks on the inside of the cabinet to be sure that all four screws are aligned and mounted at the same height. Use hole 10 for the first tray and hole 19 for the second.

3. **Locate the proper mounting holes by using the rack alignment template for the Sun StorEdge Expansion and Sun Fire cabinet (FIGURE 2-3).**

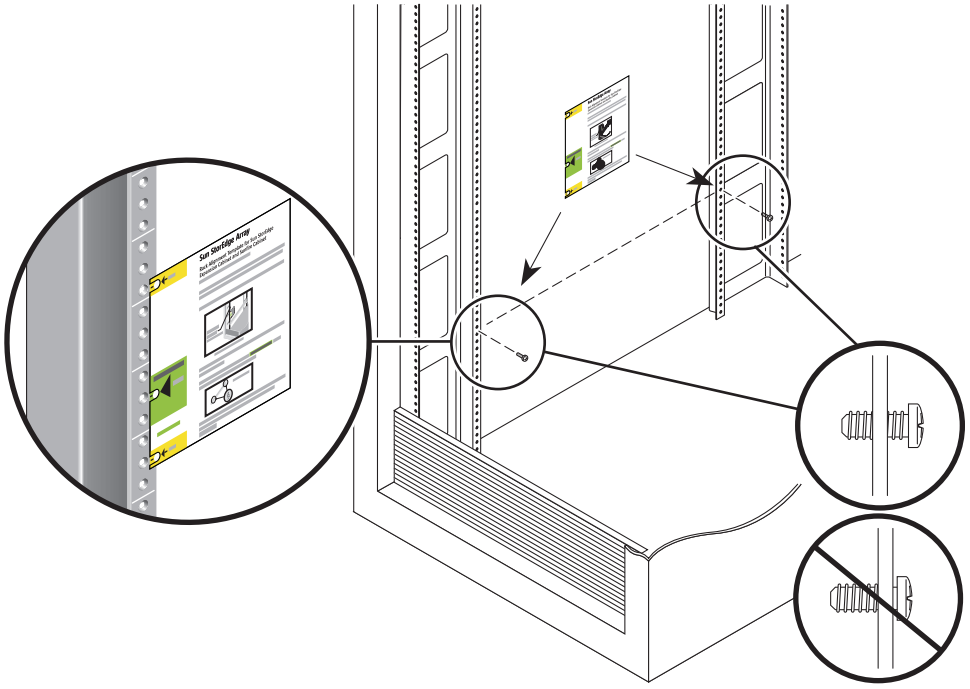


FIGURE 2-3 Inserting Mounting Hole Screws and Positioning the Rack Alignment Template

4. **Place the template over the front left rail inside the cabinet.**
5. **Slide the template up and down until all three holes line up with the cabinet rail holes.**
6. **Note the screw hole number of the mounting hole that will be used by the keyhole slots in the rail (**FIGURE 2-4**).**

   You will use the same screw hole number for the front and back mounting holes on the left and right sides inside the cabinet.

7. **Hang the left rail by aligning the large slots of the rail over the front and back screws and then pulling the rail down so that each screw is at the top of the slot (FIGURE 2-4). Repeat for the right rail.**

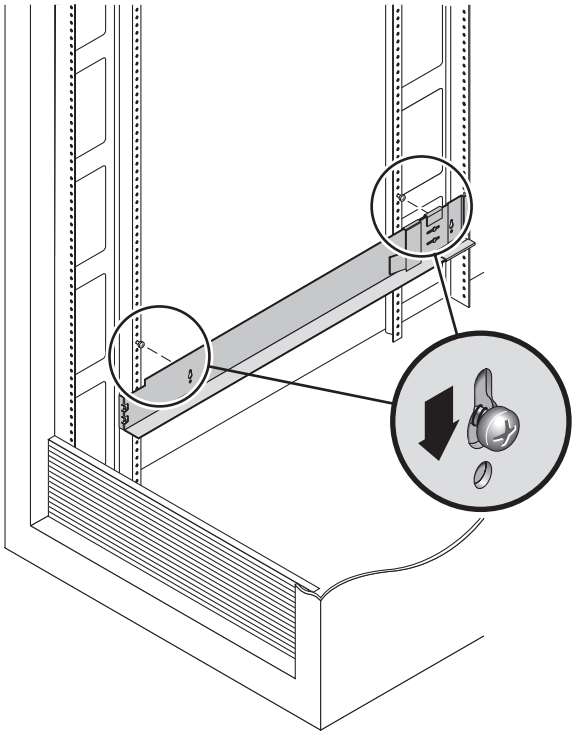


FIGURE 2-4 Hanging the Left Rail

8. **For the Sun StorEdge Expansion cabinet, adjust the length of each rail to fit the cabinet.**

9. **Using the #2 Phillips screwdriver, insert two 8-32 screws in the front of the left rail to secure the rail to the front of the cabinet (FIGURE 2-5). Repeat for the right rail.**

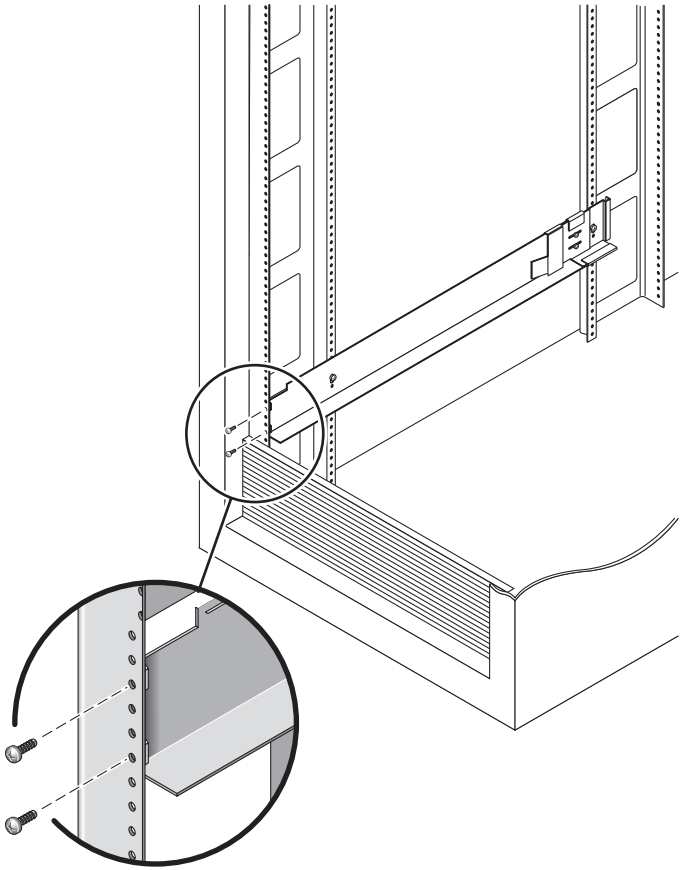


FIGURE 2-5 Securing the Left Rail to the Front of the Cabinet

10. **Using the #2 Phillips screwdriver, insert two 10-32 screws in the lower side mounting holes of the side rails (FIGURE 2-6). Use hole 8 for the first tray and hole 11 for the second tray. Repeat for the right rail.**

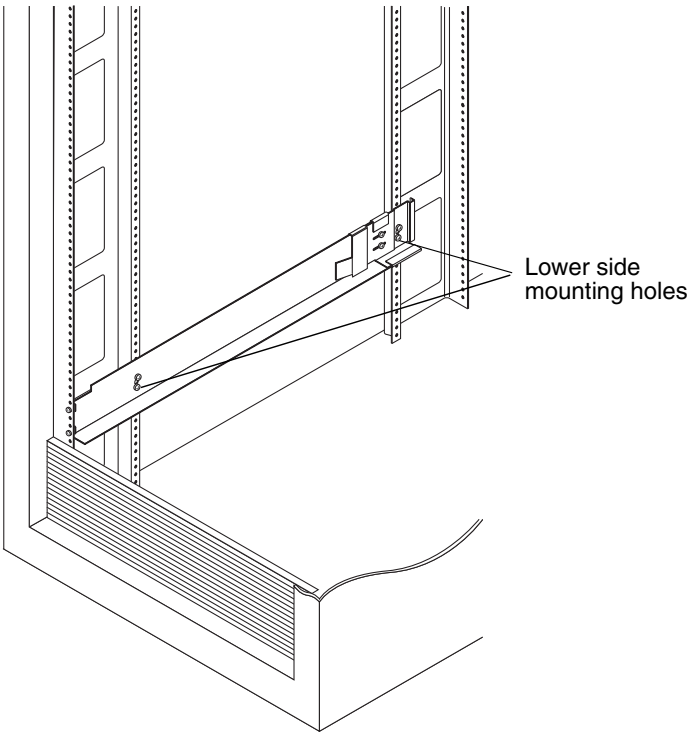


FIGURE 2-6 Inserting Screws in the Lower Side Mounting Holes of the Cabinet

11. **Tighten all screws on the left and right rails.**
    - For the Sun StorEdge Expansion cabinet, tighten the six screws on the left and right rails.
    - For the Sun Fire cabinet, tighten the four screws on the left and right rails.

Attaching the Rails to the Sun Rack 900/1000 Cabinet

1. **Using the #2 Phillips screwdriver, loosen the side-rail screws and adjust each rail to its maximum length (**FIGURE 2-7**).**

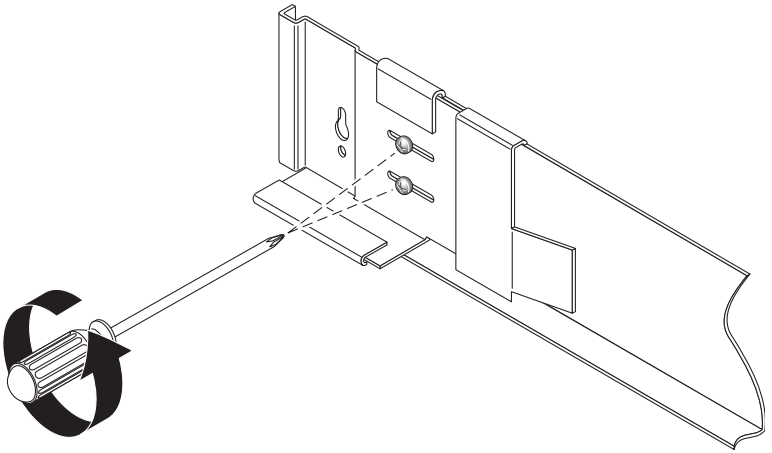


FIGURE 2-7 Loosening the Rail Screws to Adjust the Rail Length

2. **Locate the proper mounting holes by placing the rack alignment template for the Sun Rack 900/1000 cabinet over the front left cabinet rail (**FIGURE 2-8**).**

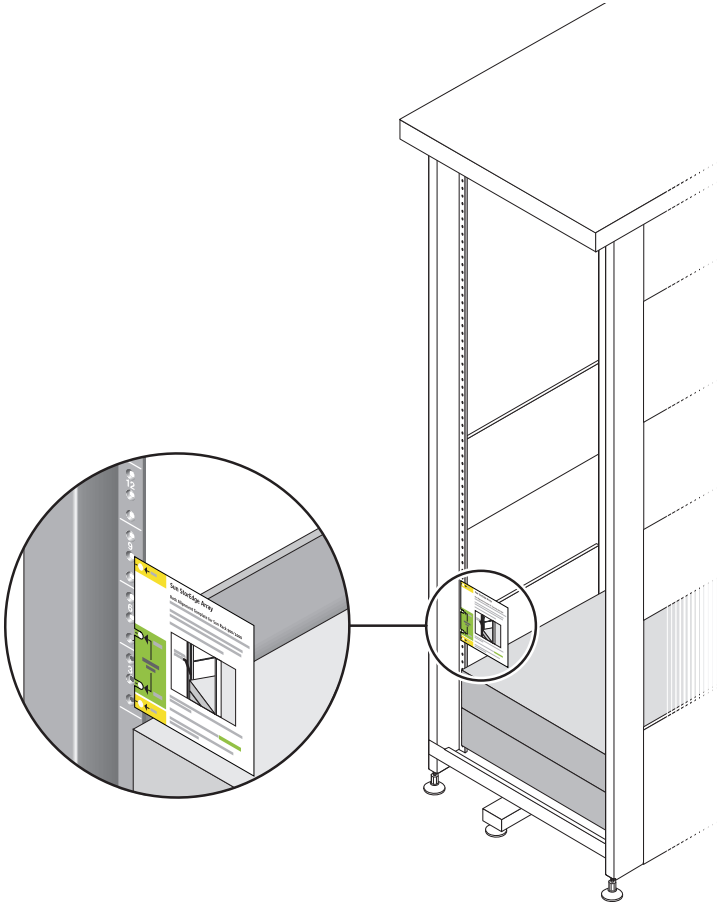


FIGURE 2-8 Positioning the Rack Alignment Template

3. **Slide the template up and down until all four holes line up with the cabinet rail holes.**

4. **Note the screw hole numbers of the two mounting holes.**

   You will use the same screw hole numbers for the rest of this installation.

5. **Using the #2 Phillips screwdriver, insert and tighten two 8-32 screws to secure the the left rail to the front of the cabinet (FIGURE 2-9). Repeat for the right rail.**

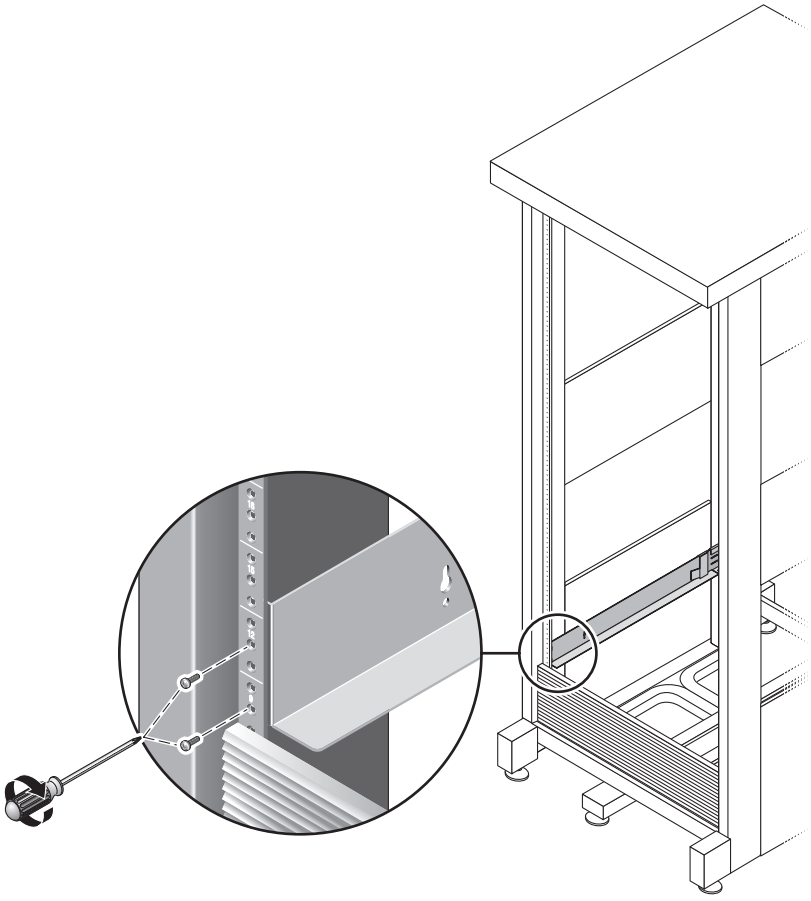


FIGURE 2-9 Securing the Left Rail to the Front of the Cabinet

6. **At the back of the cabinet, adjust the length of each rail as needed to fit the cabinet, and position the rail flange over the vertical rail (FIGURE 2-10).**

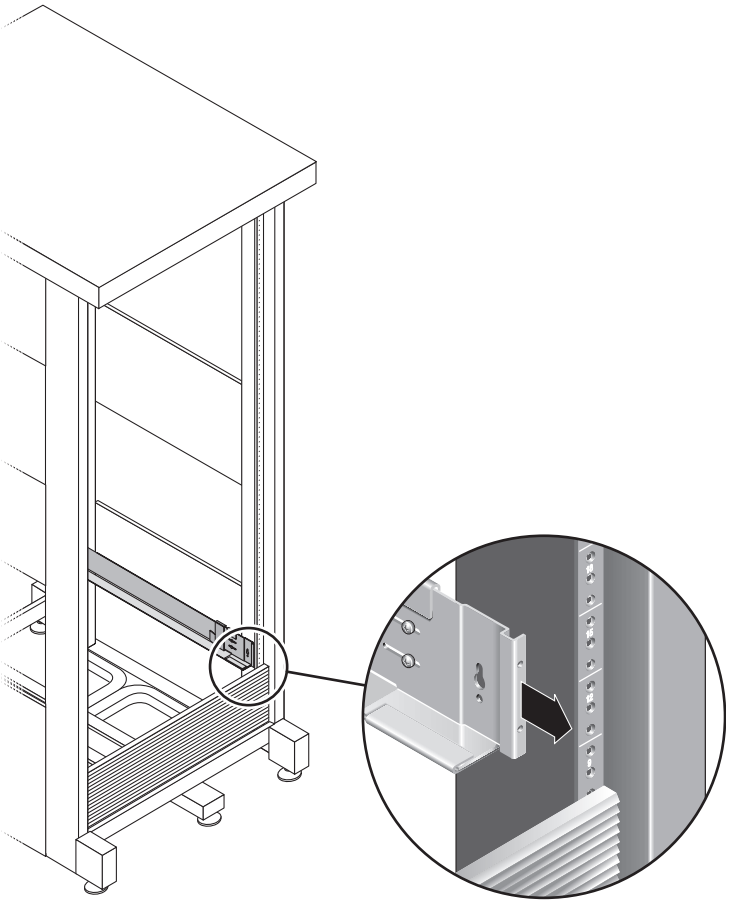


FIGURE 2-10 Adjusting the Length of the Left Rail at the Back of the Cabinet

7. **Using the #3 Phillips screwdriver, insert and tighten the M6 screws on each side at the back of the rail (FIGURE 2-11).**

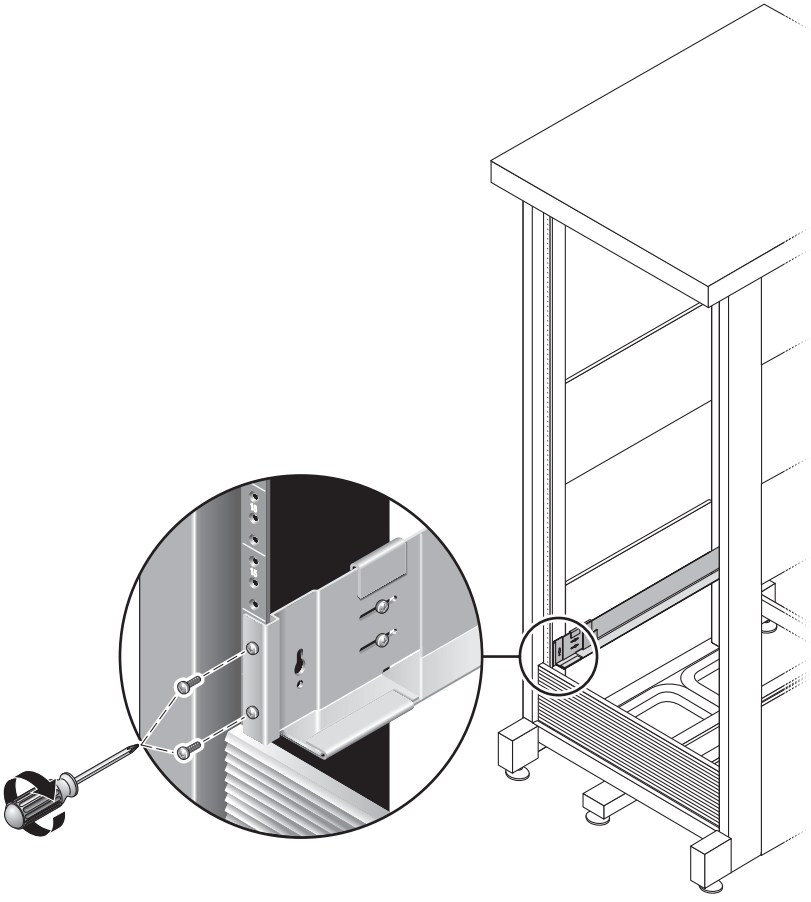


FIGURE 2-11 Securing the Right Rail to the Back of the Cabinet

8. **Using the #2 Phillips screwdriver, tighten the four adjusting screws (two on each side) toward the back of each rail (FIGURE 2-12).**

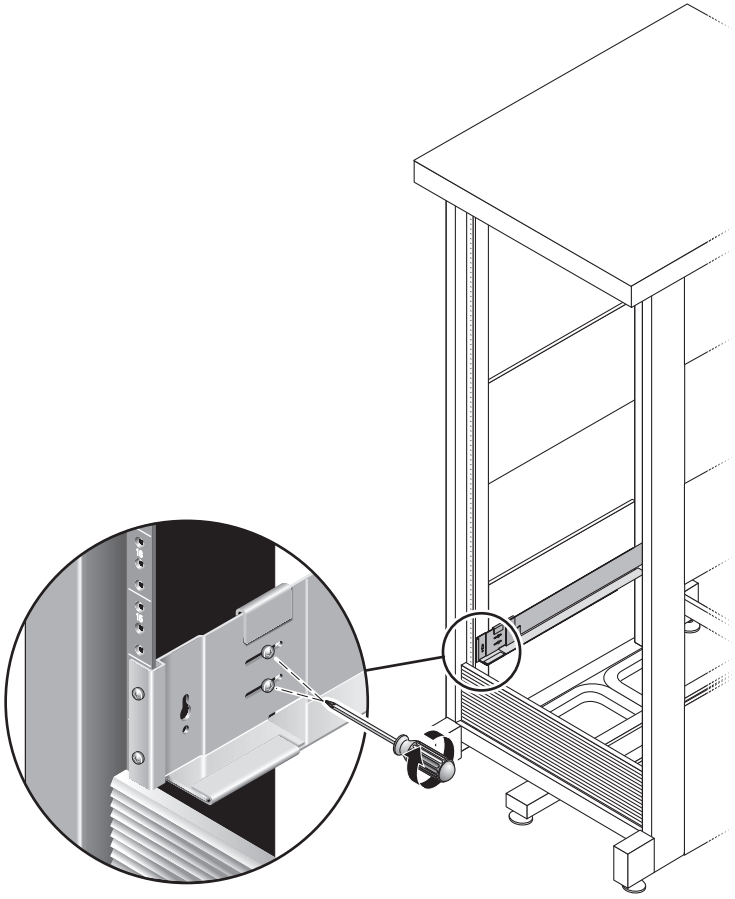


FIGURE 2-12 Tightening the Adjusting Screws

Installing a Tray in a Cabinet

Install the controller tray in the first empty slot at the bottom of the cabinet. If you are installing expansion trays, continue installing the trays from the bottom up.

After installing each tray, you must connect its power cables and set the tray ID as described on page 52.

1. **Unsnap and remove the left and right end caps on the array to permit access to the screw mounting holes (**FIGURE 2-13**).**

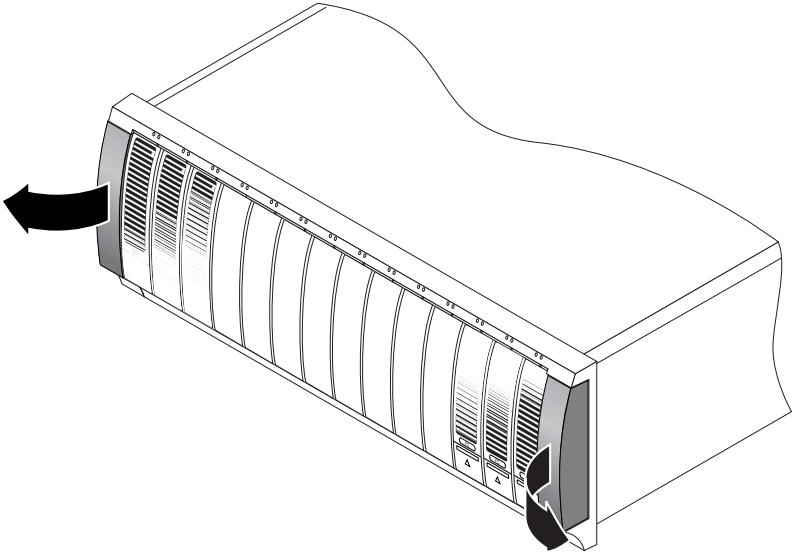


FIGURE 2-13 Removing the End Caps on the Array

2. **Using two people, one at each side of the array, carefully lift and rest the array on the bottom ledge of the left and right rails (FIGURE 2-14).**

Caution – Use care to avoid injury. An array can weigh up to 95 pounds (45 kg).

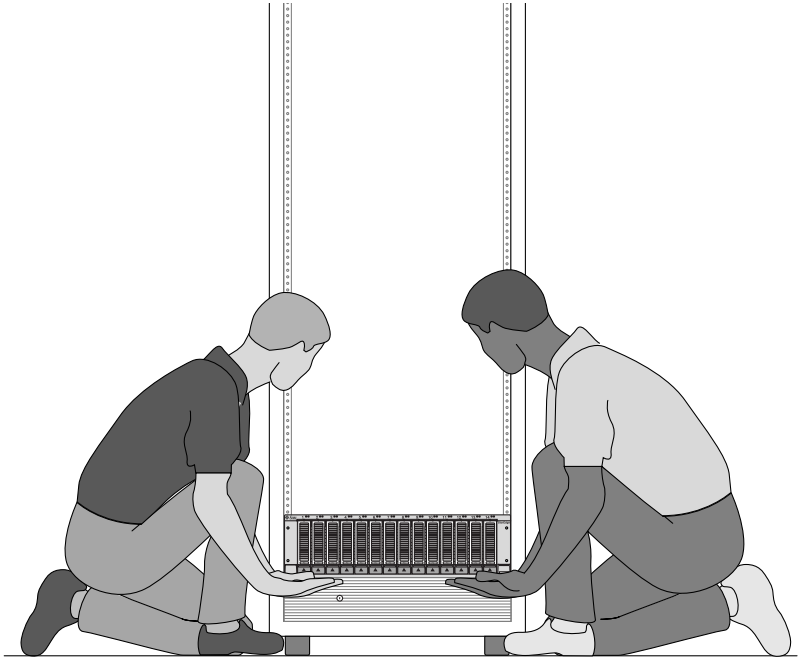


FIGURE 2-14 Positioning the Tray in the Cabinet

3. **Carefully slide the array into the cabinet until the front flanges of the array touch the vertical face of the cabinet (FIGURE 2-15).**

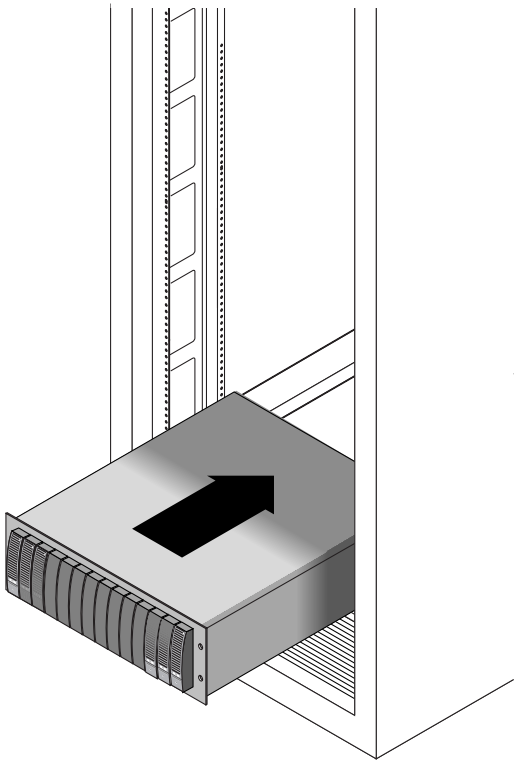


FIGURE 2-15 Sliding the Array Into the Cabinet

4. **Depending on the type of cabinet you have, do one of the following:**

   - For a Sun StorEdge Expansion or Sun Fire cabinet, use the #2 Phillips screwdriver to insert and tighten four 10-32 screws (two per side) to secure the array to the front of the cabinet (FIGURE 2-16).

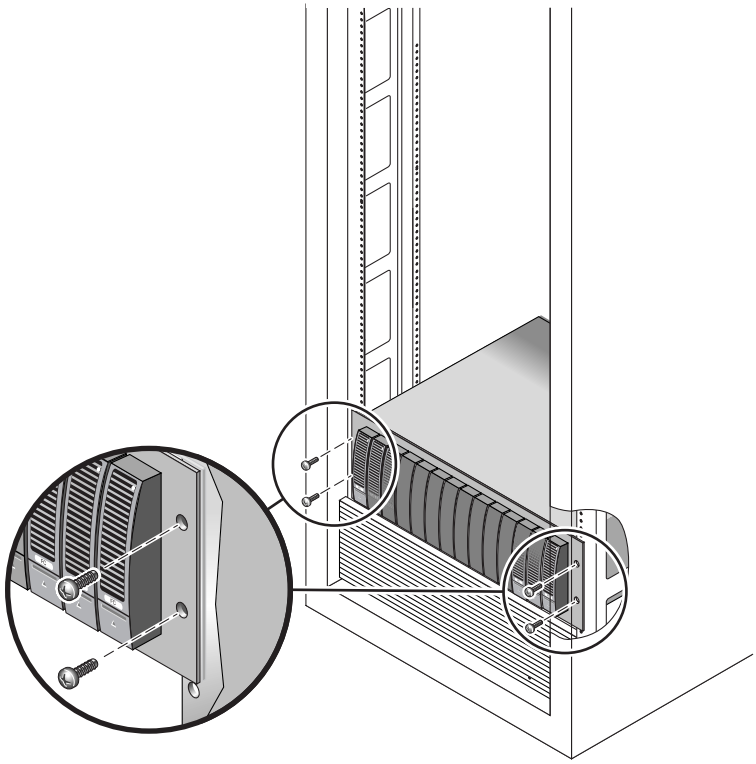


FIGURE 2-16 Securing the Array to the Front of a Sun StorEdge Expansion or Sun Fire Cabinet

- For a Sun Rack 900/1000 cabinet, use the #3 Phillips screwdriver to install and tighten four M6 screws (two per side) to secure the array to the front of the cabinet (FIGURE 2-17).

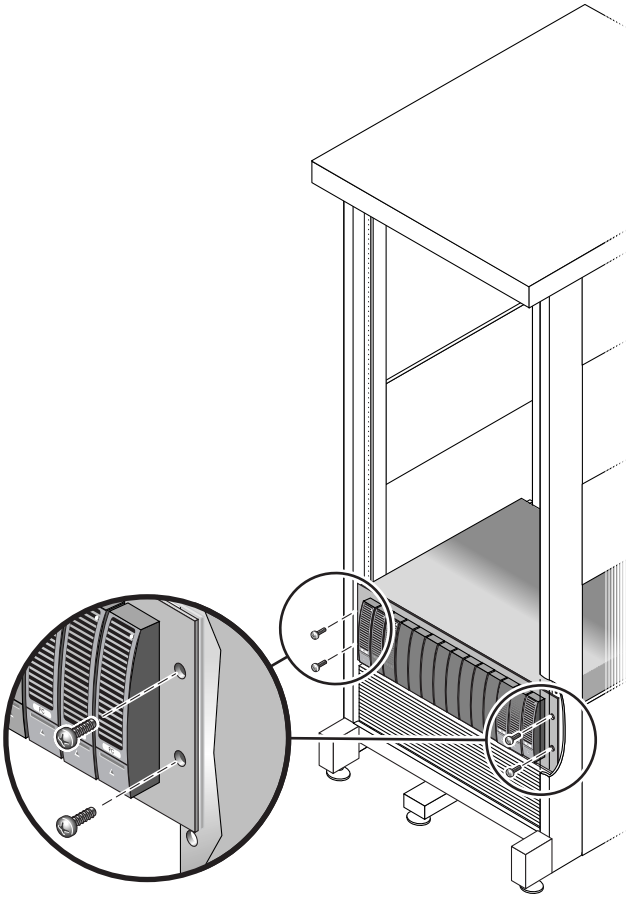


FIGURE 2-17 Securing the Array to the Front of a Sun Rack 900/1000 Cabinet

5. **Replace the left and right end caps to hide the front mounting screws.**

   The end caps snap onto the front bezel of the tray.

6. **At the back of the tray, install and tighten two 8-32 screws (one per side) to secure the back of the array to the cabinet (**FIGURE 2-18**).**

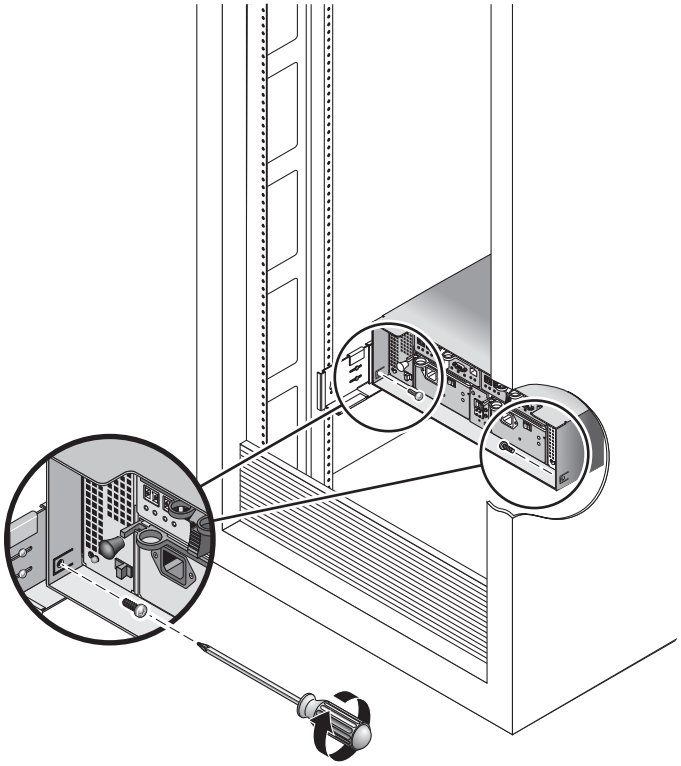


FIGURE 2-18 Securing the Array to the Back of the Cabinet

Attaching the Rails to a Telco Rack

Depending on the type of Telco rack you have, use one of the following procedures to attach the rails:

- Attaching the Rails to a Telco 2-Post Rack
- Attaching the Rails to a Telco 4-Post Rack

Because this rail kit can be adapted for several cabinets, closely follow the procedures; they may require actions you have not previously taken.

Note – In this section, you will loosely hang the rails from screws you attach to the side walls, *before* connecting the rails to the front and back.

Attaching the Rails to a Telco 2-Post Rack

This procedure describes how to attach the rackmount rail kit to a Telco 2-post 3-inch width "C" channel frame.

You will mount each tray with its horizontal center aligned with the frame of the Telco 2-post rack.

1. **Insert four 12-24 screws (two in each post) in the front and back mounting holes of the left and right posts (**FIGURE 2-19**). Do not tighten at this time.**

   Use the lowest available mounting holes at the bottom of each post. Make sure that all four screws are aligned and mounted at the same height.

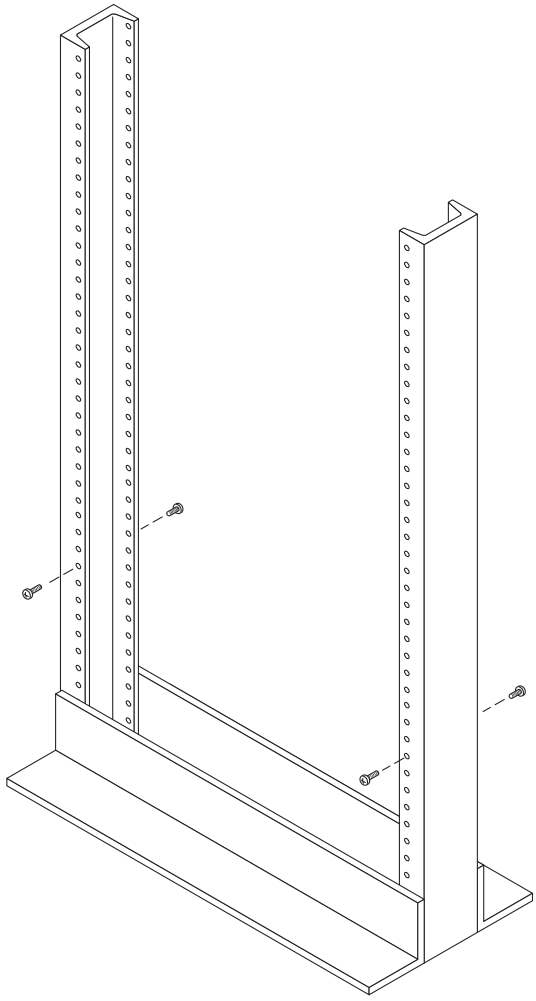


FIGURE 2-19 Inserting Screws in the Front and Back Mounting Holes

2. **Align the open slot of the left mounting rail over the front and back screws of the left post, and press the rail down until it is seated over the screws (FIGURE 2-20). Repeat for the right rail.**

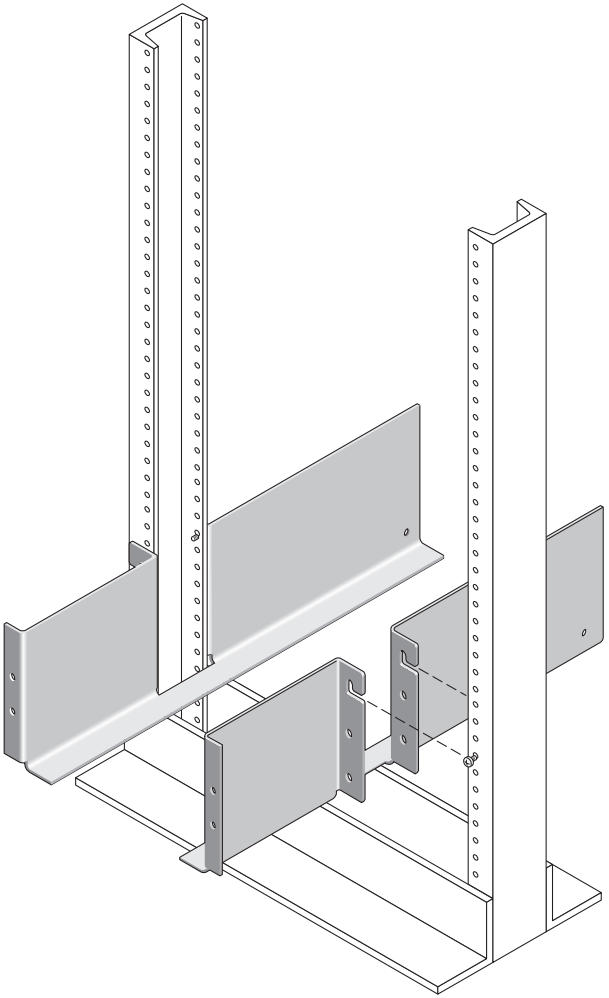


FIGURE 2-20 Seating the Mounting Rails Over the Front and Back Screws

3. **Insert eight 12-24 screws (four in each post) in the lower mounting holes at the front and back of the left and right rails (FIGURE 2-21).**

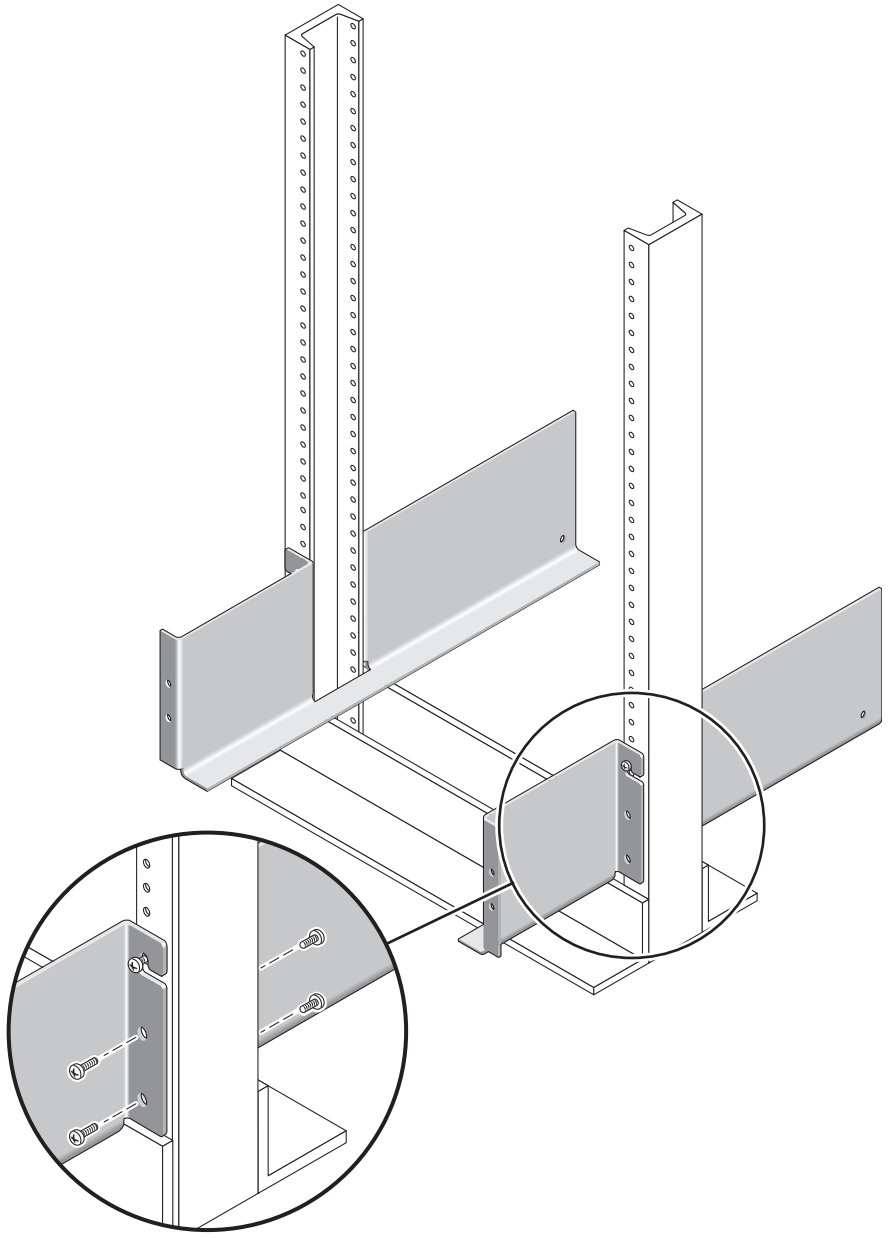


FIGURE 2-21 Inserting Screws in the Lower Mounting Holes

4. **Using the #3 Phillips screwdriver, tighten all twelve screws (six on each side) at the front and back of both mounting rails to secure each rail to its post (FIGURE 2-22).**

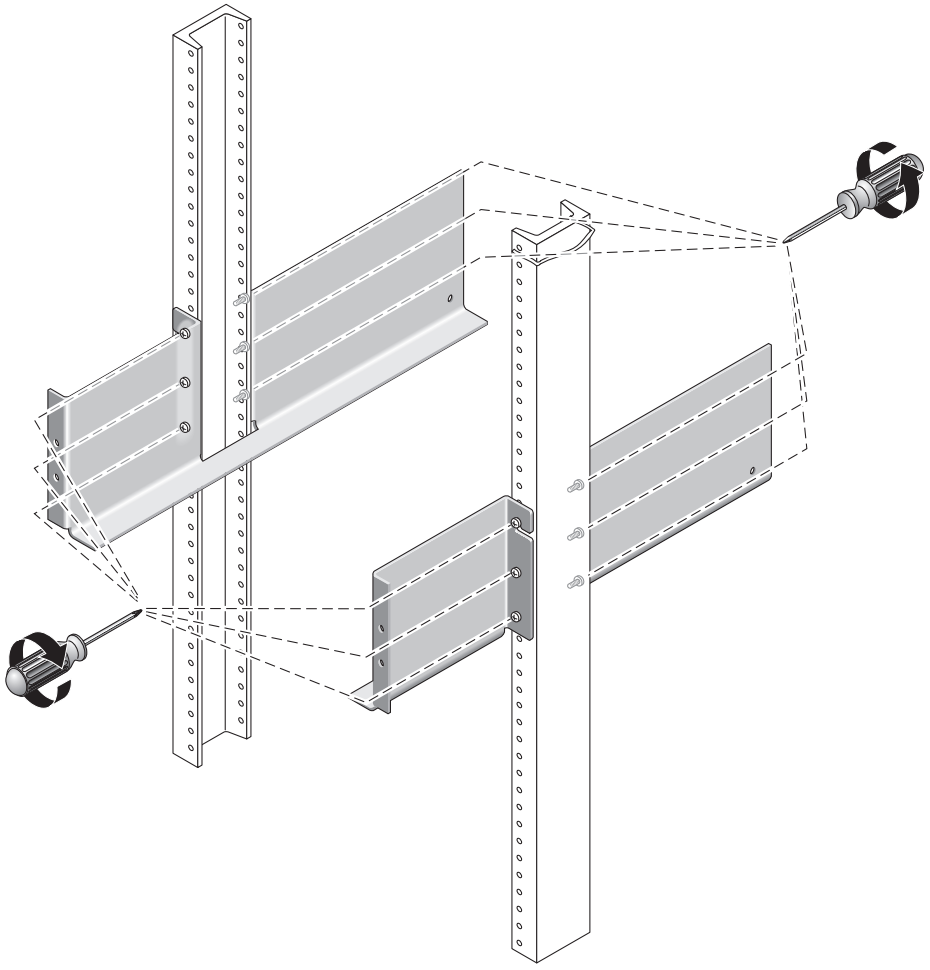


FIGURE 2-22 Tightening the Screws of the Left and Right Rails

Attaching the Rails to a Telco 4-Post Rack

This procedure describes how to attach the rackmount rail kit to a Telco 4-post 3-inch "C" rack. You can adjust the mounting rails to allow for a 12-inch to 14-inch space between the front and back posts.

1. **Insert eight 12-32 screws (two in each post) in the back mounting holes of the left and right posts (FIGURE 2-23). Do not tighten at this time.**

   Use the lowest available mounting holes at the bottom of each post. The screws in the back posts will be slightly lower than the screws in the front posts.

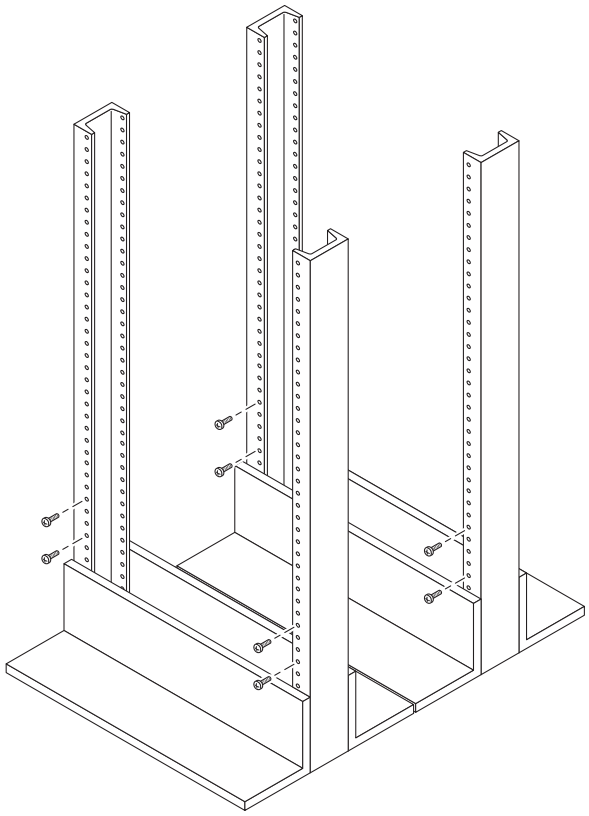


FIGURE 2-23 Inserting Screws in the Front and Back Mounting Holes

2. **Loosen, but do not remove, the two hand knobs on the adjustable bracket at the back of the left rail. Align the back bracket of the left mounting rail so it fits against the back post, and then tighten the two knobs (FIGURE 2-24). Repeat for the right rail.**

3. **Align the open slot of the left mounting rail over the front and back screws of the left post, and press the rail down until it is seated over the screws (FIGURE 2-24). Repeat for the right rail.**

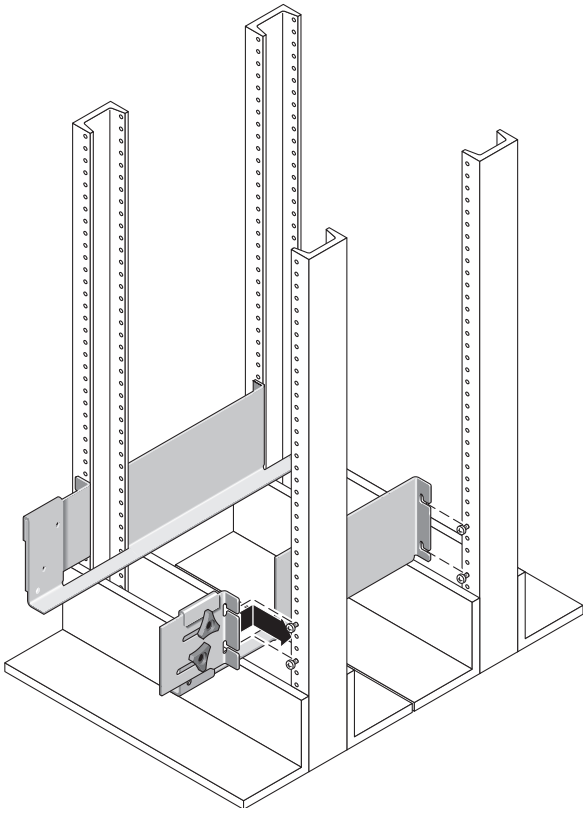


FIGURE 2-24 Installing the Mounting Rail on the Front and Back Posts

4. **Tighten the eight screws (four per side) at the front and back of both mounting rails to secure each rail to its post (FIGURE 2-25).**

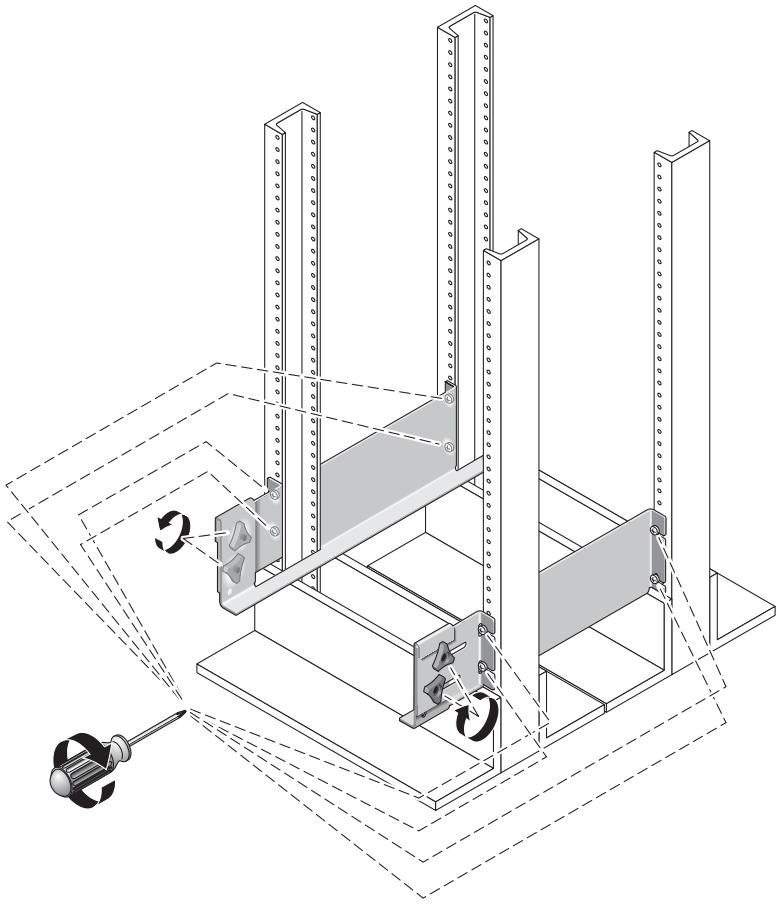


FIGURE 2-25 Tightening the Screws of the Left and Right Rails

Installing a Tray in a Telco Rack

Use the following procedures to install a tray in Telco 2-post or 4-post rack:

- "Installing a Tray in a Telco 2-Post Rack" on page 48
- "Installing a Tray in a Telco 4-Post Rack" on page 53

Be sure to install the controller tray in the first empty slot at the bottom of the cabinet. If you are installing expansion trays, continue installing the trays from the bottom up. After installing each tray, you must connect the power cables and set the tray ID as described on page 52.

Installing a Tray in a Telco 2-Post Rack

When installing a tray in a Telco 2-post rack, follow these instructions:

1. **Unsnap and remove the left and right end caps on the tray to permit access to the screw mounting holes (**FIGURE 2-26**).**

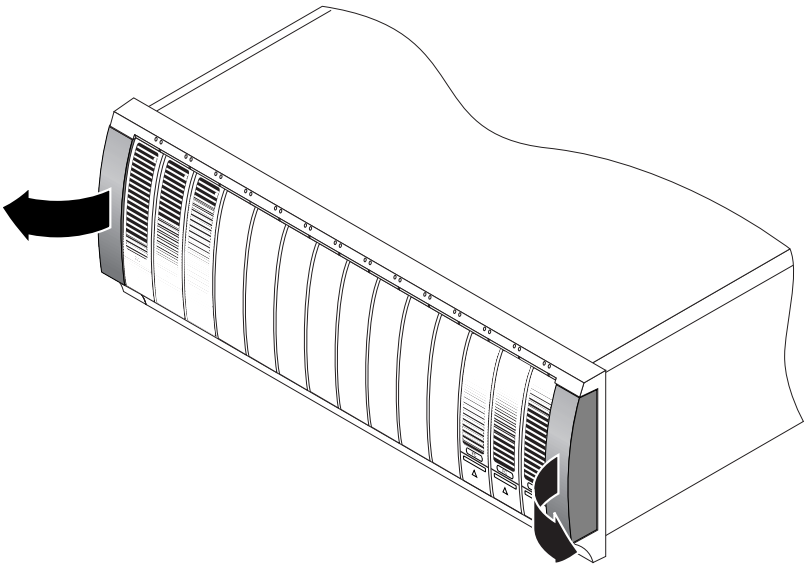


FIGURE 2-26 Removing the End Caps on the Tray

2. **Using two people, one at each side of the tray, carefully lift and rest the tray on the bottom ledge of the left and right rails (FIGURE 2-27).**

Caution – Use care to avoid injury. An tray can weigh up to 95 pounds (45 kg).

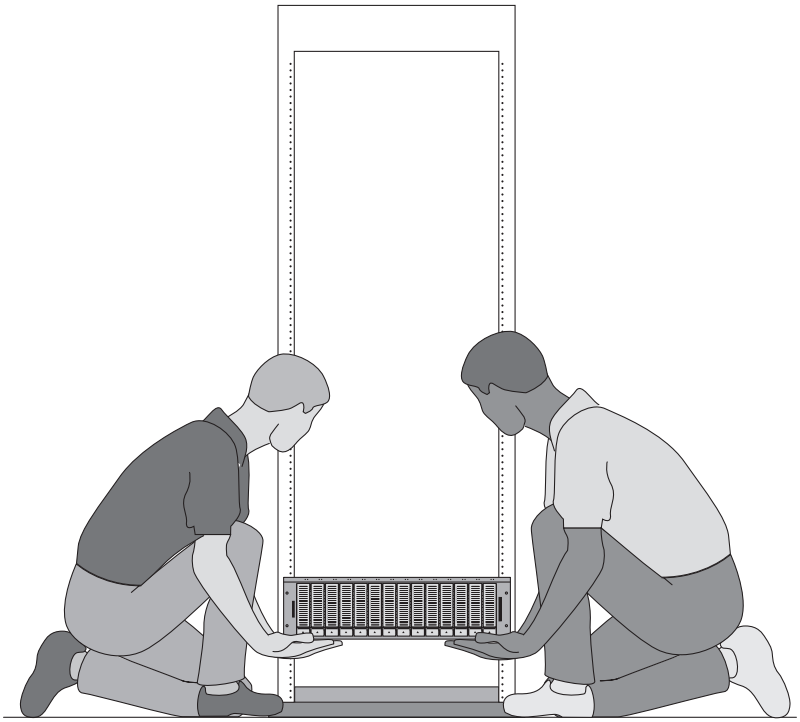


FIGURE 2-27 Positioning the Tray in the Rack

3. **Carefully slide the tray onto the mounting rails until the front bezel of the tray contacts the rail flange on each side (**FIGURE 2-28**).**

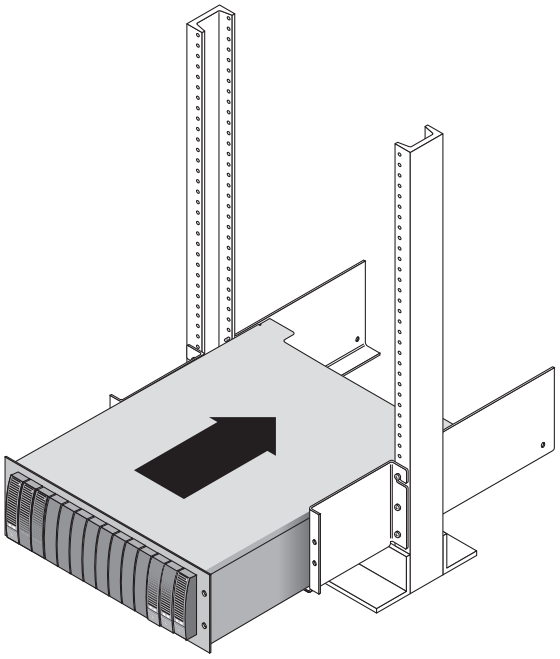


FIGURE 2-28 Sliding the Tray Into the Rack

4. **Use the #2 Phillips screwdriver to insert and tighten four 10-32 screws (two per side) to secure the tray to the front of the rack (FIGURE 2-29).**

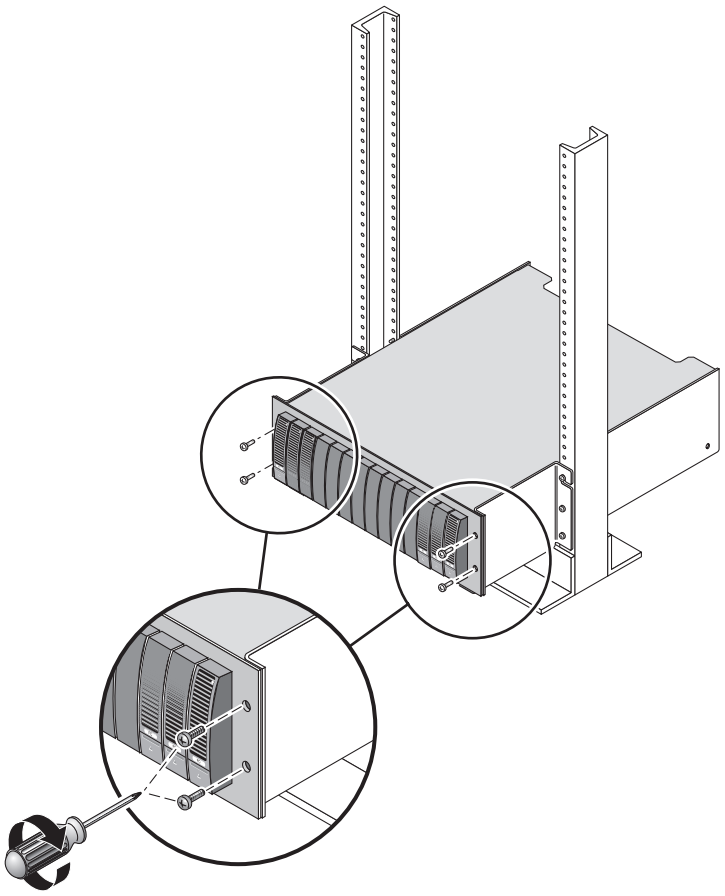


FIGURE 2-29 Securing the Tray to the Front of the Rack

5. **Replace the left and right end caps to hide the front mounting screws.**

   The end caps snap onto the front bezel of the tray.

6. **At the back of the tray, use the #2 Phillips screwdriver to install and tighten two 8-32 screws (one per side) through the back mounting points (FIGURE 2-30).**

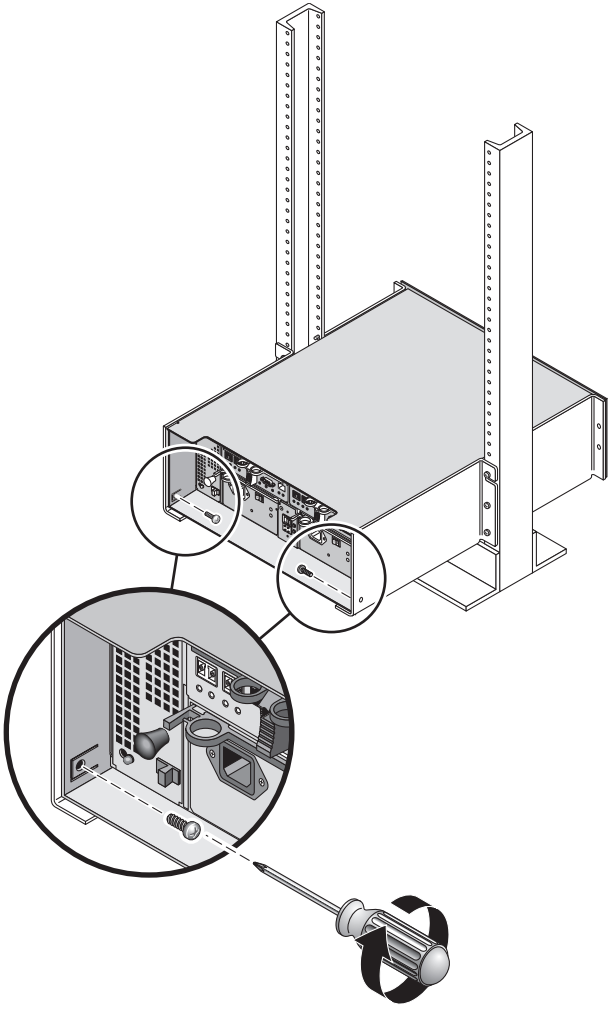


FIGURE 2-30 Securing the Tray to the Back of the Rack

Installing a Tray in a Telco 4-Post Rack

When installing a tray in a Telco 4-post rack, follow these instructions:

1. **Unsnap and remove the left and right end caps on the tray to permit access to the screw mounting holes (**FIGURE 2-31**).**

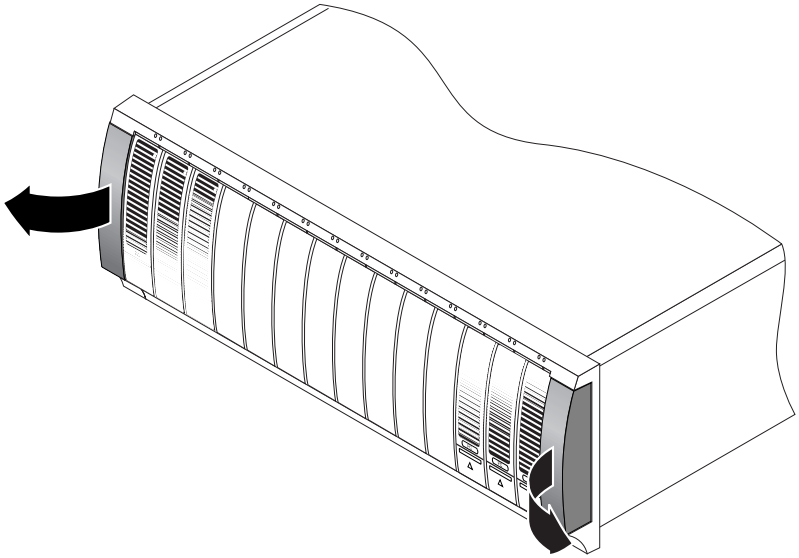


FIGURE 2-31 Removing the End Caps on the Tray

2. **Using two people, one at each side of the tray, carefully lift and rest the tray on the bottom ledge of the left and right rails (**FIGURE 2-32**).**

Caution – Use care to avoid injury. A tray can weigh up to 95 pounds (45 kg).

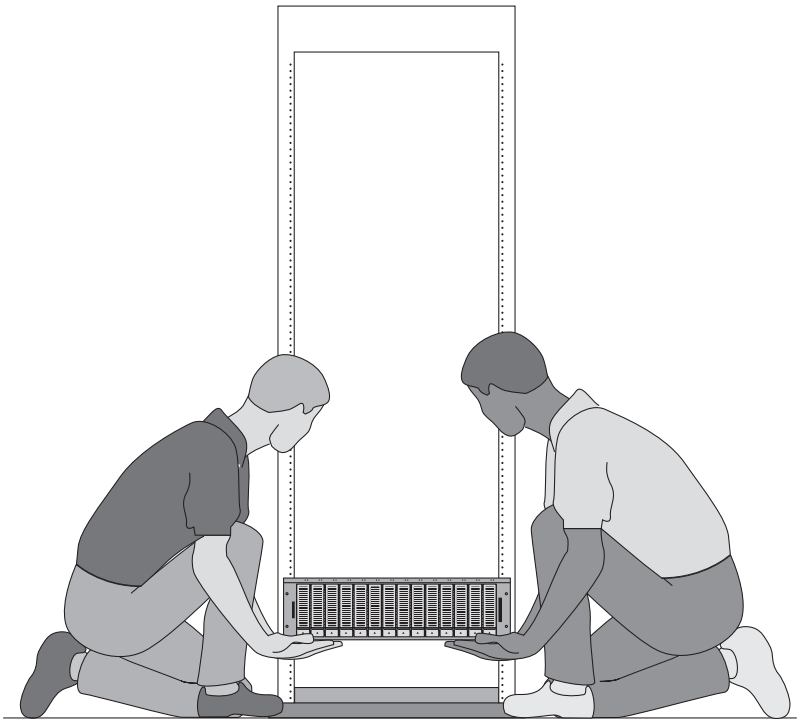


FIGURE 2-32 Positioning the Tray in the Rack

3. **Carefully slide the tray onto the mounting rails until the front bezel of the tray contacts the rail flange on each side (**FIGURE 2-33**).**

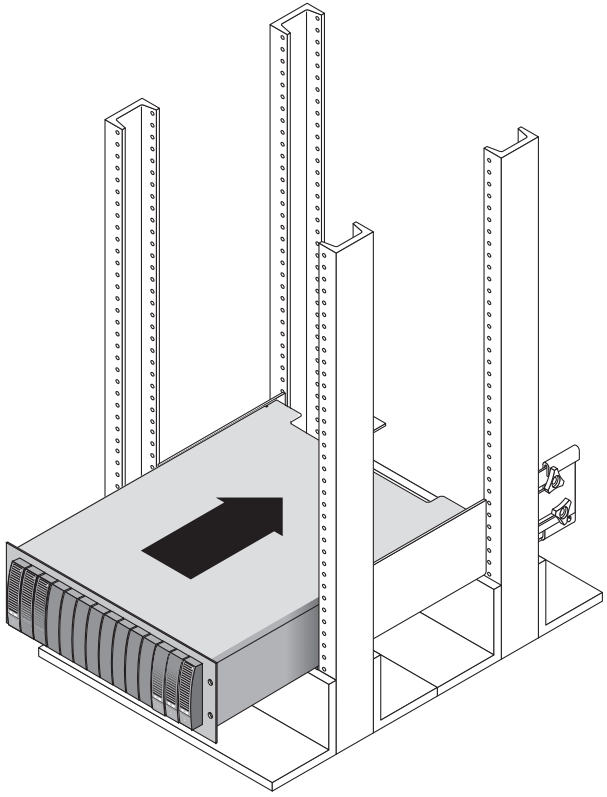


FIGURE 2-33 Sliding the Tray Into the Rack

4. **Use the #2 Phillips screwdriver to insert and tighten four 10-32 screws (two per side) to secure the tray to the front of the rack (**FIGURE 2-34**).**

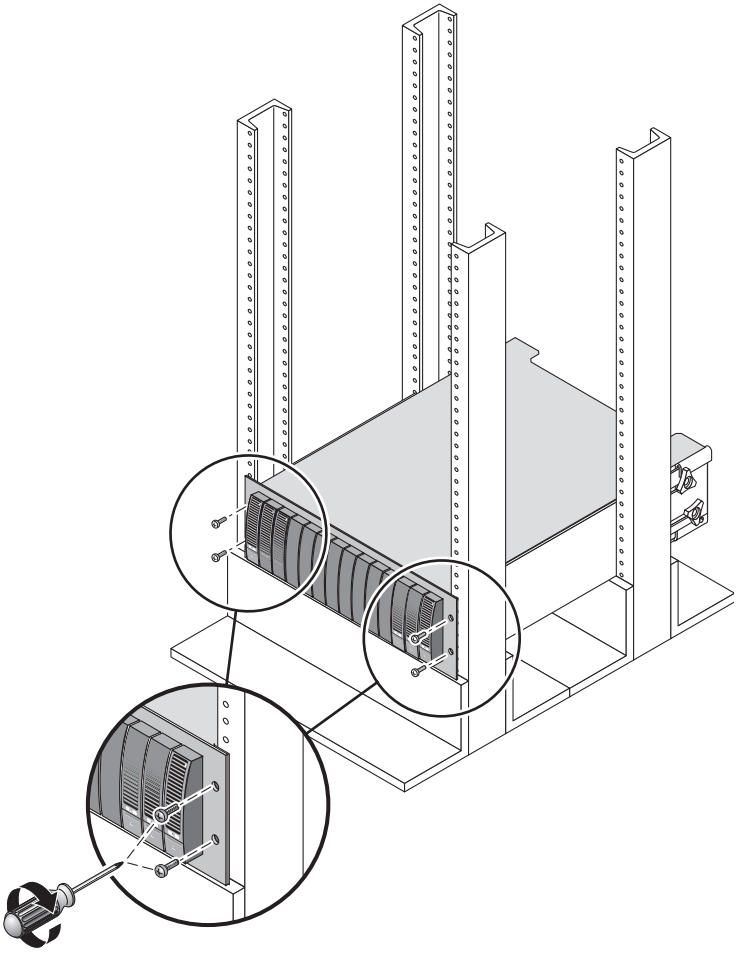


FIGURE 2-34 Securing the Tray to the Front of the Rack

5. **Replace the left and right end caps to hide the front mounting screws.**
   The end caps snap onto the front bezel of the tray.

6. **At the back of the tray, use the #2 Phillips screwdriver to install and tighten two 8-32 screws (one per side) through the back mounting points (FIGURE 2-35).**

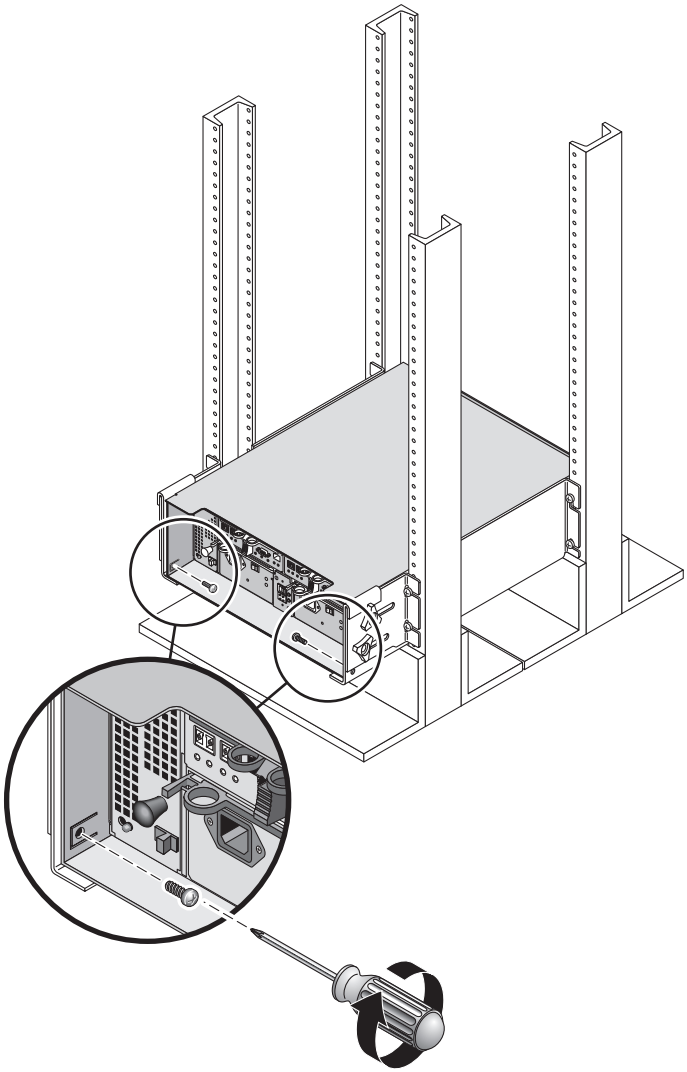


FIGURE 2-35 Securing the Tray to the Back of the Rack

Connecting the Power Cables

1. **Verify that both power switches are off for each tray in the cabinet.**
2. **Connect each power supply in the tray to a separate power source in the cabinet.**
3. **Connect the primary power cables from the cabinet to the external power source.**

Note – Do not power on the array until you complete the procedures in this chapter. The power-on sequence is described in detail in Chapter 3.

Setting the Tray ID

You set the tray ID using the Tray ID switch at the back of the controller tray. You must set the tray ID of each tray to a unique number from 00 to 77.

1. **Locate the Tray ID switch at the back of the controller tray, between the two power supplies (**FIGURE 2-36**).**

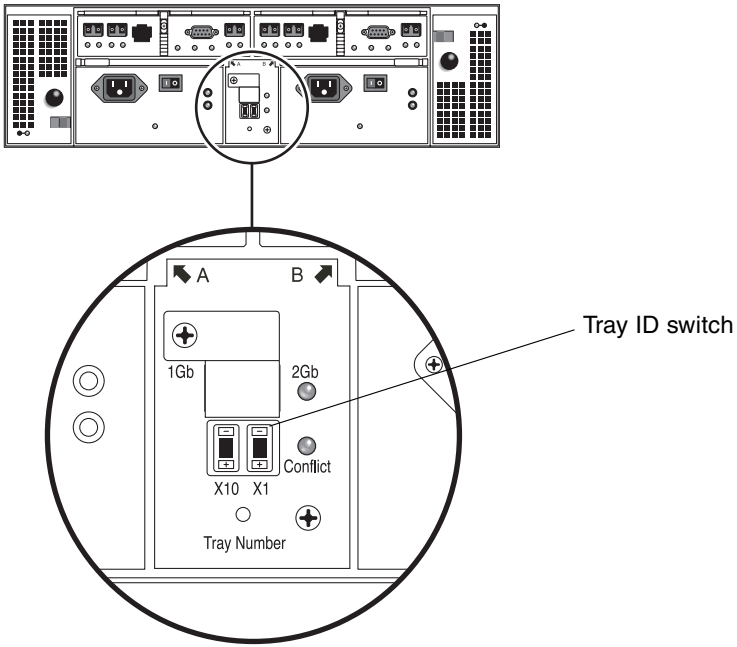


FIGURE 2-36 Tray ID Switch

2. **Use a pen tip to press the plus and minus buttons on the X10 and X1 switch to the appropriate setting.**

   The X10 switch at the left sets the tens place of the tray ID, and the X1 switch sets the ones place. For example, to set the tray ID to 11, set the X10 switch to 1 and the X1 switch to 1.

   By convention, tray ID 00 refers to the controller tray. The first expansion tray located above the controller tray is tray ID 01. The second expansion tray is tray ID 02. The tray ID increments by 01 for each expansion tray installed in the cabinet.

   When you have finished installing all trays, connecting their power cables, and setting their tray IDs, you are ready to connect the controller array to the expansion trays as described in the next section.

Intertray Cabling

This section describes how to cable a controller tray to expansion trays for several different configurations. The controller tray uses Controller A and Controller B expansion ports to connect to FC-AL ports at the back of an expansion tray (FIGURE 2-37).

Note – If you are installing a mixture of FC and SATA trays, be sure to install the SATA trays first, followed by the FC trays. Installing in this order allows you to install either a SATA or FC tray without having to take an outage.

When installing FC trays, you should also ensure that they are installed contiguously. For additional information, see the *Sun StorEdge 6130 Array 1.1 Release Notes*.

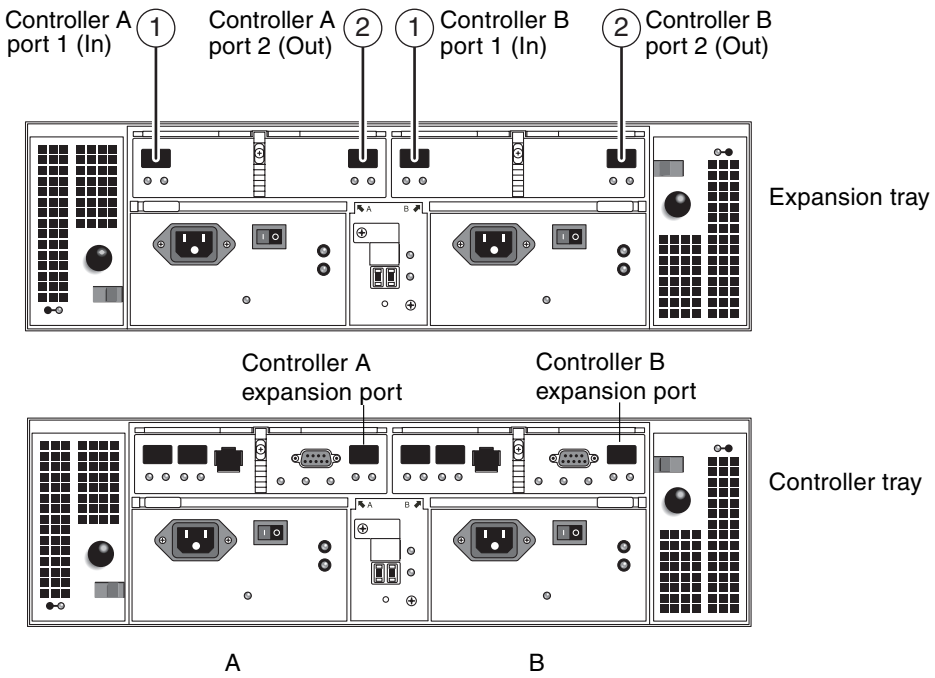


FIGURE 2-37 Expansion and Controller Tray Ports

The configuration naming convention is “controllers x trays” where the first number is the controller tray and the second is the total number of trays. For example, 1x1 is a standalone controller tray, 1x2 is one controller tray and one expansion tray, and 1x8 is one controller tray and 7 expansion trays (TABLE 2-1).

TABLE 2-1 Controller and Expansion Tray Configurations

Configuration Identifier	Number of Controller Trays	Number of Expansion Trays
1x1	1	0
1x2	1	1
1x3	1	2
1x4	1	3
1x5	1	4
1x6	1	5
1x7	1	6
1x8	1	7

Use the following instructions to connect the dual-RAID controller tray to one or more expansion trays. Interconnection cabling instructions are provided for 1x2, 1x3, 1x4, and 1x8 configurations. You can also use these instructions as a guide for cabling 1x5, 1x6, and 1x7 configurations.

Cabling a 1x2 Array Configuration

A 1x2 array configuration consists of one controller tray and one expansion tray. Two 2-meter copper FC cables are required (530-3327-01).

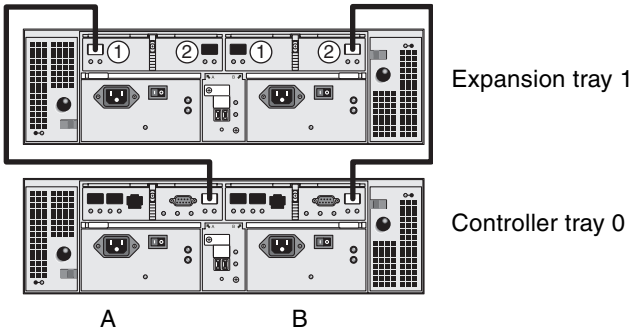


FIGURE 2-38 1x2 Array Configuration Cable Interconnection

1. **Locate the Controller A side and B side expansion ports at the back of the controller tray (**FIGURE 2-37**).**
2. **Locate the Controller A side and B side FC-AL ports 1 and 2 at the back of the expansion tray (**FIGURE 2-37**).**
3. **Connect one FC cable between the A side expansion port of the controller tray and the A side port 1 of the expansion tray (**FIGURE 2-38**).**
4. **Connect one FC cable between B side expansion port of the controller tray and the B side port 2 of the expansion tray (**FIGURE 2-38**).**

Note – The A side port 2 and B side port 1 of expansion tray 1 remain empty.

Cabling a 1x3 Array Configuration

A 1x3 array configuration consists of one controller tray and two expansion trays. Four 2-meter copper FC cables are required (530-3327-01).

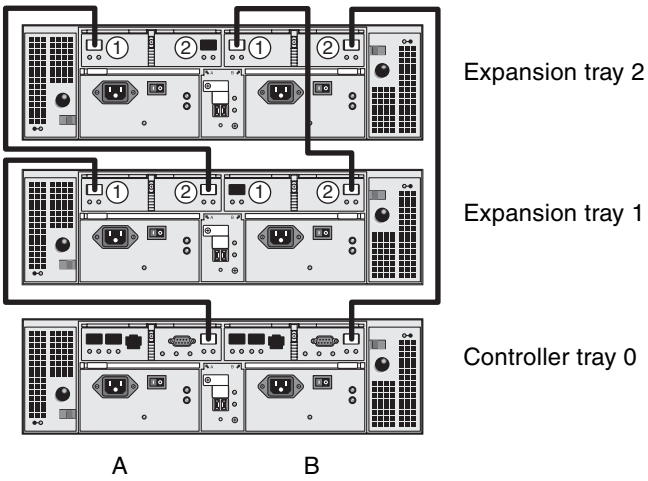


FIGURE 2-39 1x3 Array Configuration Cable Interconnection

1. **Locate the Controller A side and B side expansion ports at the back of the controller tray (**FIGURE 2-37**).**
2. **Locate the Controller A side and B side FC-AL ports 1 and 2 at the back of each expansion tray (**FIGURE 2-37**).**

3. **Connect one FC cable between the A side expansion port of controller tray 0 and the A side port 1 of expansion tray 1 (**FIGURE 2-39**).**

4. **Connect one FC cable between the A side port 2 of expansion tray 1 and the A side port 1of expansion tray 2 (**FIGURE 2-39**).**

5. **Connect one FC cable between the B side expansion port of controller tray 0 and the B side port 2 of expansion tray 2 (**FIGURE 2-39**).**

6. **Connect one FC cable between the B side port 1 of expansion tray 2 and the B side port 2 of expansion tray 1 (**FIGURE 2-39**).**

Note – The A side port 2 of expansion tray 2 and the B side port 1 of expansion tray 1 remain empty.

Cabling a 1x4 Array Configuration

A 1x4 array configuration consists of one controller tray and three expansion trays. Six 2-meter copper FC cables are required (530-3327-01).

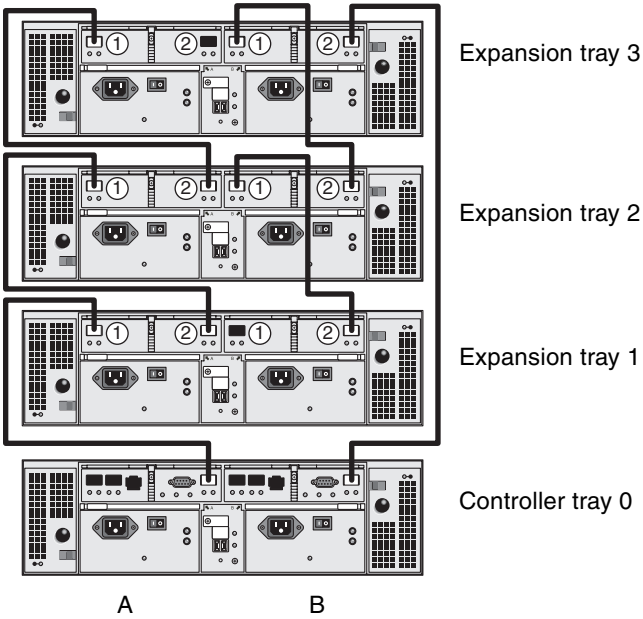


FIGURE 2-40 1x4 Array Configuration Cable Interconnection Cabling

1. **Locate the Controller A side and B side expansion ports at the back of the controller tray (**FIGURE 2-37**).**

2. **Locate the Controller A side and B side FC-AL ports 1 and 2 at the back of each expansion tray (**FIGURE 2-37**).**
3. **Connect one FC cable between the A side expansion port of controller tray 0 and the A side port 1 of expansion tray 1 (**FIGURE 2-40**).**
4. **Connect one FC cable between the A side port 2 of expansion tray 1 and the A side port 1 of expansion tray 2 (**FIGURE 2-40**).**
5. **Connect one FC cable between the A side port 2 of expansion tray 2 and the A side expansion port 1 of expansion tray 3 (**FIGURE 2-40**).**
6. **Connect one FC cable between the B side expansion port of controller tray 0 and B side port 2 of expansion tray 3 (**FIGURE 2-40**).**
7. **Connect one FC cable between the B side port 1 of expansion tray 3 and the B side port 2 of expansion tray 2 (**FIGURE 2-40**).**
8. **Connect one FC cable between the B side port 1 of expansion tray 2 and the B side port 2 of expansion tray 1 (**FIGURE 2-40**).**

Note – The A side port 2 of expansion tray 3 and the B side port 1 of expansion tray 1 remain empty.

Cabling a 1x8 Array Configuration

A 1x8 array configuration consists of one controller tray and seven expansion trays. Fourteen 2-meter copper FC cables are required (530-3327-01).

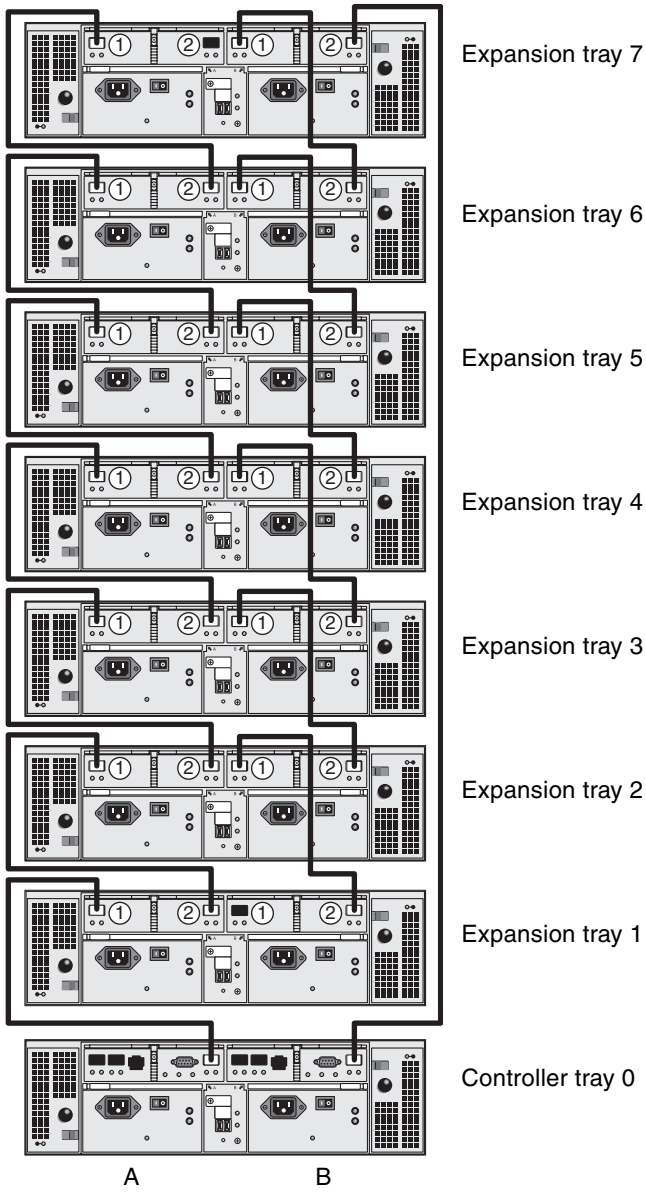


FIGURE 2-41 1x8 Array Configuration Cable Interconnection

1. **Locate the Controller A side and B side expansion ports at the back of the controller tray (**FIGURE 2-37**).**
2. **Locate the Controller A side and B side FC-AL ports 1 and 2 at the back of each expansion tray (**FIGURE 2-37**).**
3. **Connect one FC cable between the A side expansion port of controller tray 0 and the A side port 1 of expansion tray 1 (**FIGURE 2-41**).**
4. **Connect one FC cable between the A side port 2 of expansion tray 1 and the A side port 1 of expansion tray 2 (**FIGURE 2-41**).**
5. **Continue to connect one FC cable between the A side port 2 of each expansion tray and the A side port 1 of the expansion tray directly above it, until the A sides of all expansion trays are interconnected with FC cables (**FIGURE 2-41**).**
6. **Connect one FC cable between the B side expansion port of controller tray 0 and the B side port 2 of expansion tray 7 (**FIGURE 2-41**).**
7. **Connect one FC cable between the B side port 1 of expansion tray 7 and the B side port 2 of expansion tray 6 (**FIGURE 2-41**).**
8. **Continue to connect one FC cable between the B side port 1 of each expansion tray and the B side port 2 of the expansion tray directly below it, until the B sides of all expansion trays are interconnected with FC cables (**FIGURE 2-41**).**

Note – The A side port 2 of expansion tray 7 and the B side port 1 of expansion tray 1 remain empty.

Next Steps

After you cable all of the trays, you can power on the trays, as described in Chapter 3.

CHAPTER 3

Powering On and Setting the Link Rate

This chapter describes initial tray power-on procedures. It contains the following sections:

- "Before Powering On" on page 67
- "Powering On Trays" on page 68
- "Checking the Link Rate LED" on page 69
- "Powering Off the Array" on page 70
- "Next Steps" on page 71

Before Powering On

You can set up a Dynamic Host Configuration Protocol (DHCP) server to issue the IP address to each controller. If a DHCP server is not available, the controller tray defaults to internal static IP addresses. (See "Configuring the IP Address of the Array Controllers" on page 84 for details.)

For instructions on how to set up the DHCP server, see "Configuring a DHCP Server" on page 143.

Powering On Trays

Use this procedure to turn power on for all trays installed in the cabinet.

Note – The order in which you power up the trays is important. Be sure to power on the controller tray last in order to ensure that the disks in the expansion trays have enough time to spin completely before being scanned by the RAID controllers in the controller tray. Power sequences may also be involved here.

---

1. **Turn off both power switches on each tray that you want to connect to the cabinet's main power (FIGURE 3-1).**

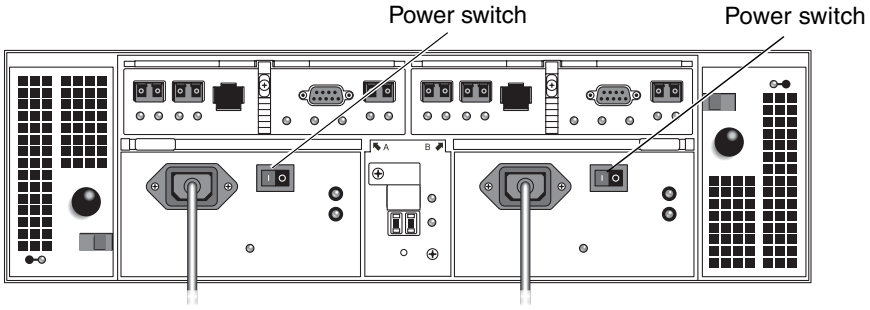


FIGURE 3-1 Tray Power Connectors and Switches

2. **Connect the power cable for each tray power supply to a separate power source in the cabinet.**
3. **Make sure the cabinet circuit breakers are turned off.**
4. **Connect the primary power cables from the cabinet to the external power source.**
5. **Turn on the cabinet circuit breakers.**
6. **Press the power switches at the back of each expansion tray to the On position.**
7. **Press each power switch at the back of the controller tray to the On position.**

   While the tray powers up, the green and amber LEDs on the front and back of the tray turn on and off intermittently. Depending on your configuration, it can take several minutes for the tray to power up.
8. **Check the status of each tray.**

- After the LEDs stop blinking, check the LEDS on the front and back of the tray. All the green LEDs should be on and the amber LEDs should be off.
- If the LEDs are green, the power-on sequence is complete and no faults have been detected.

Checking the Link Rate LED

The link rate switch allows you to set the data transfer rate. The default setting is 2 gigabits (Gbits) per second.

1. **Locate the link rate switch at the back of the array, between the two power supplies (**FIGURE 3-2**).**

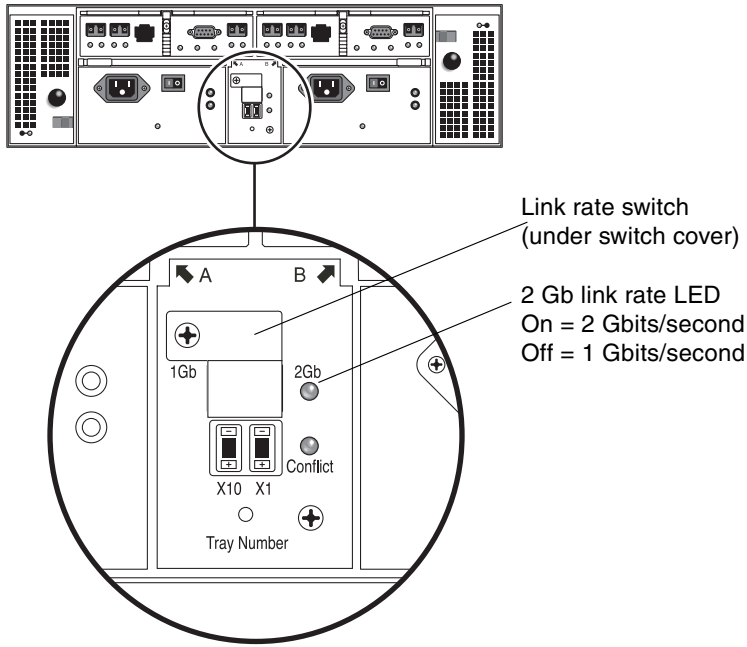


FIGURE 3-2 2 Gb Link Rate LED

- If the 2 Gb LED is lit, the link rate is already set to 2 Gbits per second.
- If the link rate LED is not lit, set the link rate to 2 Gbits per second as described in Step 2 through Step 4.

2. **Remove the screw and the switch cover.**

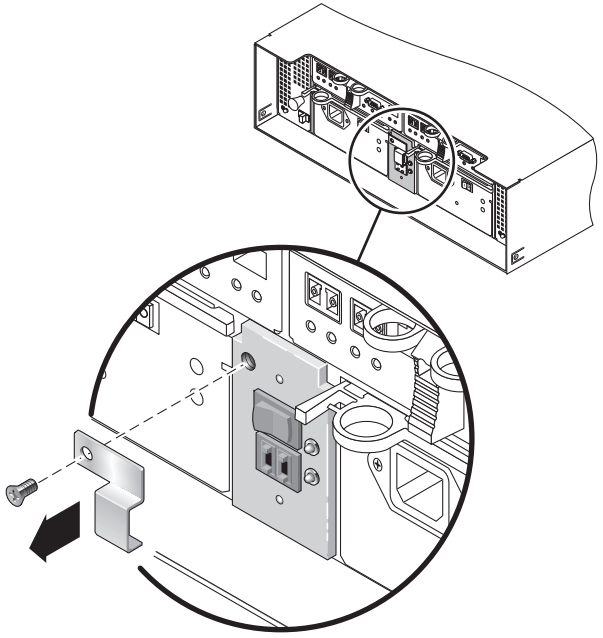


FIGURE 3-3 Accessing the Link Rate Switch

3. **Set the link rate to 2 Gb.**
4. **Replace the switch cover and tighten the screw to secure it.**

Powering Off the Array

The array rarely needs to be powered off. You remove power only when you plan to physically move the array to another location.

To power off the array, do the following:

1. **Stop all I/O from the hosts to the storage system.**
2. **Wait approximately 2 minutes until all disk drive LEDs have stopped flashing.**

   After the 2-minute period, data residing in cache is written to disk and the battery mechanisms are disengaged.

3. **Check the cache LED on the controller to determine if any outstanding cache needs to be written.**

   If the LED is flashing, there is still data that needs to be flushed and written to disk.

4. **Ensure that the LED is no longer flashing before powering off the array.**

Note – If Media Scan is enabled (the default), the disk drive LEDs will continue to flash after the 2-minute period has elapsed. By waiting the 2-minute period, you ensure that the data residing in cache has been written to disk. The LED flash rate during a media scan is different than the flash rate of I/O.

---

5. **Press each power switch at the back of the controller tray to the Off position.**
6. **Press the power switches at the back of each expansion tray to the Off position.**

Next Steps

Now you are ready to connect the management host and data hosts, as described in Chapter 4.

CHAPTER 4

Connecting the Management Host and Data Hosts

This chapter describes Sun StorEdge 6130 array cable connections for hosts. It contains the following sections:

- "Connecting the Management Host" on page 73
- "Connecting Data Hosts" on page 74
- "Next Steps" on page 78

Connecting the Management Host

The management host directly manages Sun StorEdge 6130 arrays over an out-of-band network. This section describes how to connect the physical Ethernet and power cables to the management host.

Before You Begin

Before you begin, ensure that the two Ethernet cables are used to connect the management host. These requirements are outlined in the *Sun StorEdge 6130 Array Site Preparation Guide*.

Connecting the Ethernet Cables

1. **Locate the Ethernet ports for Controller A and Controller B at the back of the controller tray (FIGURE 4-1).**

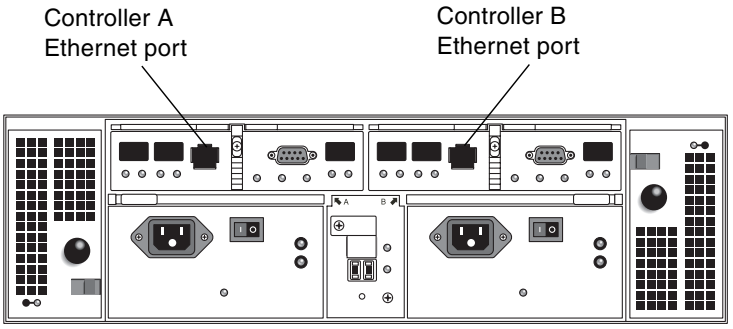


FIGURE 4-1 Ethernet Ports for Controller A and Controller B

2. **Connect an Ethernet cable to each Ethernet port.**
3. **Connect the other end of each Ethernet cable to a LAN that can be reached by your management host (preferably on the same subnet).**

Connecting Data Hosts

You can connect data hosts to access the Sun StorEdge 6130 array through Fibre Channel (FC) switches to the array or directly to the array.

Connecting Data Hosts Through External Fibre Channel Switches

You can connect the Sun StorEdge 6130 array to data hosts through external FC switches.

Before you connect data hosts, check that the following prerequisites have been met:

- The FC switch has been installed and configured as described in the vendor's installation documentation. (See the *Sun StorEdge 6130 Array Release Notes* for a list of supported switches.)
- Interface cables are connected and routed between the host bus adapters (HBAs), switches, and installation site.

- Fiber-optic cables (2-meter or required length) are available to connect the array to the FC switch.

1. **Locate the host ports (SFP transceivers) at the back of the controller tray (FIGURE 4-2).**

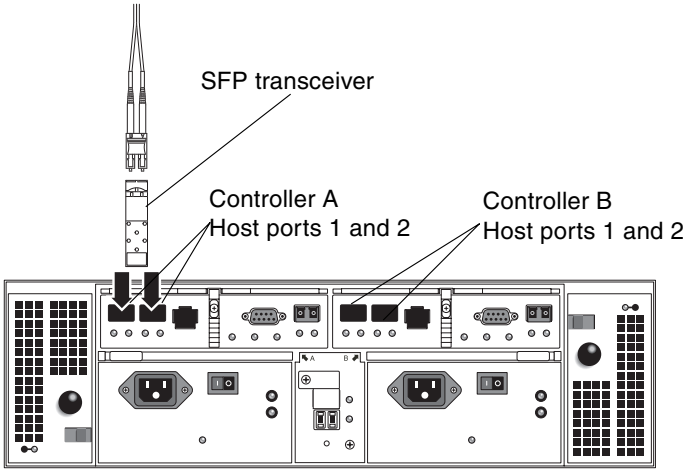


FIGURE 4-2 Host Connections

2. **Connect each fiber-optic cable to the host port of Controller A and Controller B.**

Caution – Fiber-optic cables are fragile. Do not bend, twist, fold, pinch, or step on the fiber-optic cables. Doing so can degrade performance or cause data loss.

---

3. **Connect the other end of each cable to the external switch as shown in the graphics that follow.** FIGURE 4-4 **shows the external switch with cross-connections.** Note that this configuration is not yet supported for use within a SunCluster.

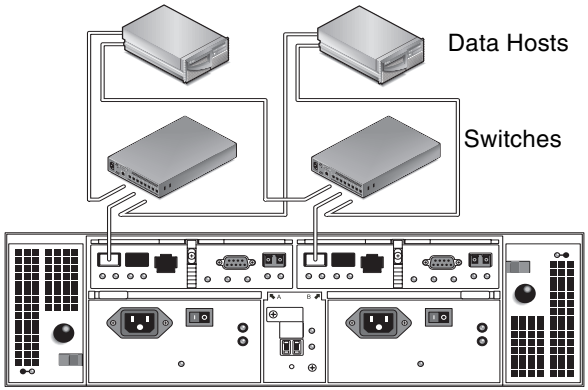


FIGURE 4-3 Connecting Data Hosts via a Switch

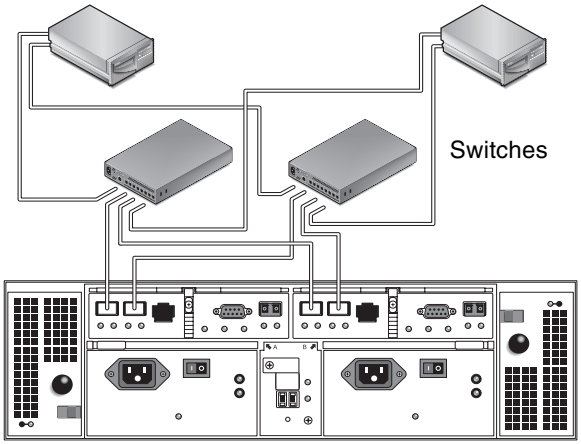


FIGURE 4-4 Connecting Data Hosts via a Switch with Cross-Connections

4. **Connect the cables from the switch to the HBAs for each data host.**

Connecting Data Hosts Directly

A direct point-to-point connection is a physical connection in which the HBAs are cabled directly to the array's host connectors.

Before you connect data hosts directly to the array, check that the following prerequisites have been met:

- Interface cables are connected and routed between the HBAs and the installation site.
- Fiber-optic cables (2-meter or required length) are available to connect the array to the data host HBAs.

The Sun StorEdge 6130 array has four host connections, two per controller. To maintain redundancy, connect one data host to both Controller A and Controller B.

1. **Locate the host ports at the back of the controller tray (**FIGURE 4-2**).**
2. **Connect a fiber-optic cable to each host port on Controller A and Controller B.**

Caution – Fiber-optic cables are fragile. Do not bend, twist, fold, pinch, or step on the fiber-optic cables. Doing so can degrade performance or cause data loss.

---

3. **Connect the other end of each fiber-optic cable to the HBAs (**FIGURE 4-5 **and** FIGURE 4-6**).**

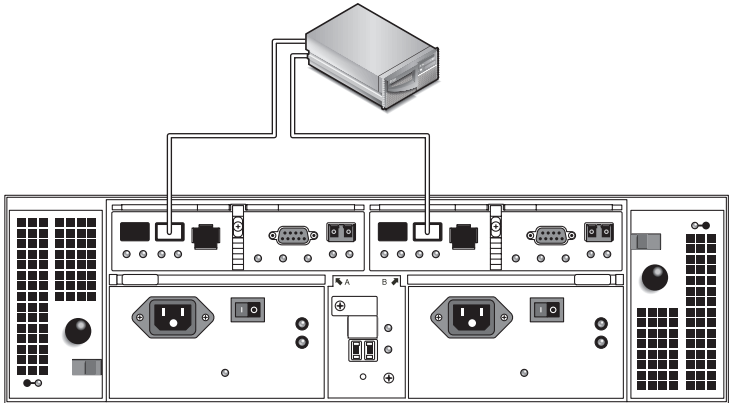


FIGURE 4-5 Direct Connection to a Single Host With Dual HBAs

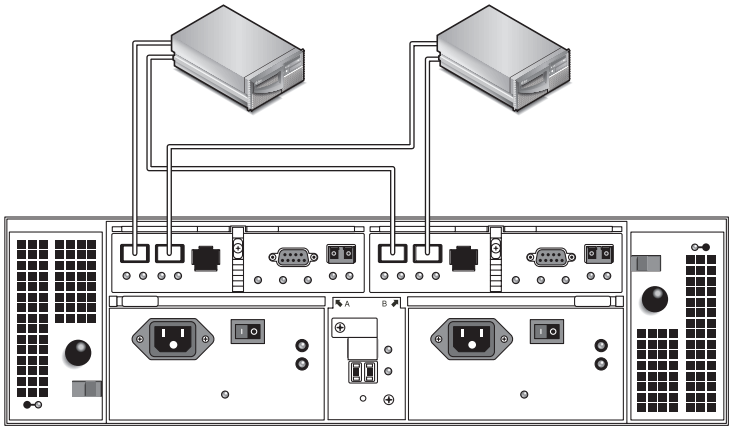


FIGURE 4-6 Direct Connection to Dual Hosts With Dual HBAs

Next Steps

After you have connected the management host and data hosts, you are ready to install the management and data host software as described in Chapter 5.

CHAPTER 5

Installing the Management Software

This chapter describes how to install the management software on the management host. It contains the following sections:

- "Before You Begin" on page 79
- "Running the Installation Script" on page 80
- "Installing the remote CLI Client on a Solaris host" on page 83
- "Configuring the IP Address of the Array Controllers" on page 84
- "Next Steps" on page 91

Before You Begin

The Sun StorEdge 6130 array is managed out-of-band by way of a standard Ethernet connection between the RAID controllers and your local area network (LAN).

The Sun StorEdge 6130 management software is distributed on the Sun StorEdge 6130 Host Installation Software CD that is shipped with the array. Note that you can also download the latest version of the software from the following site: http://www.sun.com/download/index.jsp?cat=Systems%20Administration&tab=3&subcat=Storage%20Management

The management software consists of the following applications and tools:

- Sun Java Web Console, the user interface, and related components for the array management software
- Storage Automated Diagnostic Environment software (Enterprise Edition 2.4)
- Sun StorEdge SFK (including the multipathing MPxIO driver)
- Array and drive firmware
- Remote CLI client for the Solaris operating system

Before you start the installation of the management software, check the machine for the following requirements:

- The operating system is Solaris 8 OS Update 4, Solaris 9 OS for the SPARC platform, or Solaris 10.
- The root password of the management host is available (for running the installation script). Note that the root password is required for the initial login to the Java Web Console after the software is installed.
- 430 megabytes of disk space is available.
- Previous versions of the management software are not installed.
- Previous versions of the Storage Automated Diagnostic Environment will be detected and automatically upgraded by the installer. See "Running the Installation Script" on page 80 for further details.
- Previous versions of the Sun StorEdge SFK software are not installed in Solaris 8 and 9. The SFK is embedded in Solaris 10, however, and should not be removed.
- A service such as the Storage Automated Diagnostic Environment is not running on the array's Ethernet ports.

The installation script verifies these requirements. If a requirement is not met, the script informs you or, in some cases, exits.

Note – If a version of Sun Java Web Console prior to 2.1 is installed on the management host, the script prompts you to upgrade to the current version of the Java Web console. If you choose not to upgrade, the script will exit.

Running the Installation Script

Before you start the script, check that all of the requirements are met, as listed in "Before You Begin" on page 79.

1. **Log in to the Solaris OS as** `root`**.**
2. **Insert the host software installation CD into a local drive.**
3. **Change to the /**`cdrom/cdrom0`** directory:**

   ```
   cd /cdrom/cdrom0
   ```

4. **Start the installation script by typing:**

   ```
   ./install -n
   ```

The -n option specifies a non-interactive installation. After choosing the software you want to install, you will not be prompted to press Return during the installation.

Header information appears, and then the following is displayed:

```
                    Host Software Installation
                   ----------------------------

This script installs software for your Sun StorEdge 6130
storage system.


Software components included in this distribution:

        - Sun StorEdge 6130 Data Host Software
        - Sun StorEdge 6130 Management Host Software
        - Sun StorEdge 6130 Remote Management Host Software

You may install any or all of these components on your system.

Sun StorEdge 6130 Remote Management Host Software is a subset of
Sun StorEdge 6130 Management Host Software. You will not be
prompted whether to install the former if the latter is selected.

Do you want to continue? [y/n] :
```

5. **Type y to continue the installation.**

   You are prompted to select the software package you want to install.

6. **To install only the management software, type n and then y as follows:**

```
Do you want to install ....

        Sun StorEdge[tm] 6130 Data Host Software [y/n] : n
        Sun StorEdge[tm] 6130 Management Host Software [y/n] : y
```

Note – You can also install the data host and management software on the same Solaris machine. If you choose to install the data host software on the management host, you must enable the multipathing software as described in "Enabling Multipathing Software" on page 116.

---

7. **At the following prompt, type `y` to confirm the software you selected.**

   If there is no previous version of StorADE or sccs on the system, the prompt appears as follows:.

```
You have chosen to install the following components:


        Sun StorEdge[tm] 6130 Management Host Software

Do you want to continue? [y/n] : y
```

   If there is a previous version of StorADE or sccs, or both of them on the system, the prompt appears as follows:.

```
You have chosen to install the following components:


        Sun StorEdge[tm] 6130 Management Host Software

The following component will be upgraded:

        Sun Storage Automated Diagnostic Environment 2.3
        Sun StorEdge Remote Management Host Software 2.0

Do you want to continue? [y/n] : y
```

   Installation of the management software takes approximately 25 minutes.

   When the installation is complete, a confirmation of the packages you installed is displayed followed by the date and time that the installation finished and the name of the file containing the installation log. For example:

```
Finished at: Tue Aug 24 17:58:31 PDT 2004
Note: A log of this procedure has been saved to
/var/sadm/install/se6130/6130_Host_SW_install.log
```

8. **Eject the CD and remove it from the drive.**

9. **Be sure to reboot the Management Host. (Note that this applies only to those Management Hosts that are also Data Hosts).**

   `reboot -- -r`

Installing the remote CLI Client on a Solaris host

Follow the instructions in "Running the Installation Script" on page 80 to:

- Log on to the Solaris OS
- Insert the host software installation CD
- Change the directory
- Start the installation script

Header information appears followed by the initial installation screen.

1. **When prompted, type `y` to continue the installation.**

   You are asked to select the software package you want to install.

2. **To install only the remote management host software, type `n`, `n` and then `y` as follows:**

```
Do you want to install ....

Sun StorEdge[tm] 6130 Data Host Software [y/n] : n
Sun StorEdge[tm] 6130 Management Host Software [y/n] : n
Sun StorEdge[tm] 6130 Remote Management Host Software [y/n]: y
```

3. **At the following prompt, type `y` to confirm the software you selected.**

If there is no previous version of sccs on the system, the prompt appears as follows:.

```
You have chosen to install the following components:


        Sun StorEdge[tm] 6130 Remote Management Host Software

Do you want to continue? [y/n] : y
```

If there is a previous version of sccs on the system, the prompt appears as follows:.

```
You have chosen to install the following components:


        Sun StorEdge[tm] 6130 Remote Management Host Software

The following component will be upgraded:

        Sun StorEdge Remote Management Host Software 2.0

Do you want to continue? [y/n] : y
```

When the installation is complete, a confirmation of the packages you installed is displayed followed by the date and time that the installation finished and the name of the file containing the installation log.

When finished, follow the instructions in "Running the Installation Script" on page 80 to:

- Eject the CD and remove it from the drive
- Reboot the Management Host

Configuring the IP Address of the Array Controllers

To configure the controller's IP address you need to have an IP connection between the controller modules and a management host. You can configure the array with either a dynamic or a static IP address as described in the following sections:

- "Configuring Dynamic IP Addressing" on page 85

- "Configuring Static IP Addressing" on page 85
- "Configuring the IP Address on the Host" on page 89

Configuring Dynamic IP Addressing

Dynamic IP addresses for the array controller are assigned through a DHCP server. The dynamic IP address from a DHCP server will be used if BOOTP services are available. If you want to set up a DHCP server, refer to Appendix B for a description of how to configure BOOTP services in Sun Solaris or Microsoft Windows environments.

Configuring Static IP Addressing

This section describes how to configure static IP addresses using an existing or temporary subnet.

If a DHCP server is not available, the array uses the following default internal IP addresses:

- `192.168.128.101` for Controller A
- `192.168.128.102` for Controller B

In order to change the controllers' default IP addresses to desired static IP addresses, first set up an Ethernet interface on the management host with an IP address of `192.168.128.100` (or any IP address on the `192.168.128.0` subnet, provided it does not conflict with the controller tray's IP address). Then use one of the methods described in the following sections to establish the IP connectivity between the management host and the controller modules:

- "Connecting the Controller Tray Directly to a Management Host" on page 85
- "Connecting the Controller Tray to a Management Host Using an Ethernet Hub" on page 86
- "Connecting the Controller Tray on an Existing Subnet" on page 86

Connecting the Controller Tray Directly to a Management Host

Connect Controller A to a management host directly using a cross-over Ethernet cable.

Configure the Ethernet interface on the management host with a temporary IP address of `192.168.128.100`. After you have configured the desired static IP addresses of the controllers you can set the management host's IP back to the original IP address. For more information, see "Configuring the IP Address on the Host" on page 89.

Connecting the Controller Tray to a Management Host Using an Ethernet Hub

Use RJ-45 Ethernet cables to connect both controllers to a management host using an Ethernet hub.

Configure the Ethernet interface on the management host with a temporary IP address of `192.168.128.100`. After you have configured the desired static IP addresses of the controllers, you can set the management host's IP configuration back to the original IP address. For more information, see "Configuring the IP Address on the Host" on page 89.

Connecting the Controller Tray on an Existing Subnet

You can also configure the desired static IP address of the controllers by setting a temporary virtual subnet on an existing subnet. First, verify that the host has a network connection to both controllers to ensure the process will be successful.

To establish IP connectivity between the controller tray and the management host on an existing subnet, you must configure the Ethernet switch to pass traffic for another subnet. For example, if your management host is on a subnet of `10.3.4.0`, the associated Ethernet switch for the subnet must also allow traffic from the subnet `192.168.128.0`.

Using this method is a three-part process, as described in the following sections:

1. **Setting up a Temporary Subnet on a Management Host**
2. **Assigning Static IP Addresses to the Controller Tray**
3. **Deleting the Temporary Subnet**

Setting Up a Temporary Subnet on a Management Host

1. **To display the Ethernet ports that are in use on the server, type the following:**

```
ifconfig -a
```

The Ethernet ports that are in use are displayed, as shown in the following example:

```
lo0: flags=1000849<UP,LOOPBACK,RUNNING,MULTICAST,IPv4> mtu 8232
index 1
        inet 127.0.0.1 netmask ff000000
bge0: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu 1500
index 2
        inet 10.4.30.110 netmask ffffff00 broadcast 10.4.30.255
        ether 0:3:ba:32:4d:f1
```

2. **As `root`, configure a temporary virtual subnet, and type the following:**

   `# ifconfig` *ethernet-port*`:1 plumb`

   `# ifconfig` *ethernet-port*`:1 192.168.128.100 up`

   For example:

   `# ifconfig bge0:1 plumb`

   `# ifconfig bge0:1 192.168.128.100 up`

3. **View the changes to verify that you have established IP connectivity between the management host and the array controllers:**

   `ipconfig -a`

   Now you are ready to configure the static IP addresses of the controllers, as described in the next "Assigning Static IP Addresses to the Controller Tray" on page 87.

Assigning Static IP Addresses to the Controller Tray

1. **To access the management software, open a web browser and enter the IP address of the management host using this format:**

   `https://`*management-host*`:6789`**

   management-host is the IP address of the machine where you installed the management software.

   The login page is displayed.

2. **Log in as `root` of the management host:**

   `login:` **`root`**

   `password:` *root-password*

   root-password is the root password of the machine where you installed the management software.

3. **From the Sun Java Web Console page, click Sun StorEdge 6130 Configuration Service.**

4. **Discover the array.**

   See "Discovering and Registering Arrays" on page 102 for instructions.

5. **Select the array you want to configure.**

6. **Click Administration.**

   The General Setup page is displayed.

7. **Enter the array name and default host type and then click OK.**

8. **Click Administration > Controllers.**

   The Controller Summary page is displayed.

9. **First for Controller A and then for Controller B, select Specify Network Configuration and then enter the IP address, gateway address, and the subnet. Click OK.**

   You may see an error message indicating contact has been lost with the array as a result of changing the IP address. You can ignore this message.

10. **Log out and log in again to the console.**

11. **On the Array Summary page, select the original array with the original IP address, and delete it to clear out the old IP address.**

12. **Click Auto Discover to have the management software find the array with the new IP address.**

13. **If you are configuring multiple arrays, clean the ARP table entry for each controller:**

    `arp -d` *ip-address-controller-A*
    `arp -d` *ip-address-controller-B*

Deleting the Temporary Subnet

After you have assigned static IP addresses to the controllers, you can delete the temporary subnet.

1. **Enter the following commands as** `root`**:**

   ```
   # ifconfig bge0:1 down
   # ifconfig bge0:1 unplumb
   ```

2. **View the changes:**

   ```
   ifconfig -a
   ```

Configuring the IP Address on the Host

The method you use to configure the IP address depends on the platform you are using. Follow the instructions for your platform:

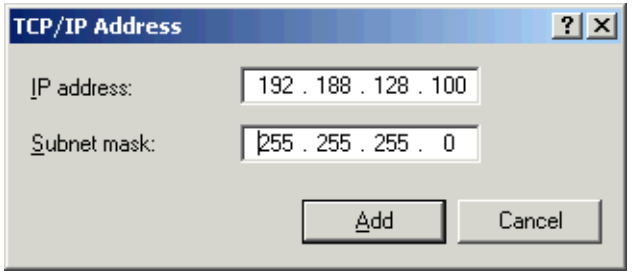
- Solaris Operating System
- Windows 2000 Advanced Server
- Windows Server 2003

Configuring the IP Address on the Management Host for the Solaris Operating System

For information about changing the IP address on a Solaris server, see the `ifconfig` man page.

Configuring the IP Address for Windows 2000 Advanced Server

1. **From the Control Panel, select Network and Dial-Up Connections.**
2. **Select Local Area Connection > Properties > Internet Protocol (TCP/IP).**
3. **Make sure that a static IP address is configured, and click Advanced.**
4. **In Advanced TCP/IP Settings, select the IP address you want to configure, and click Add directly below the IP addresses listing.**
5. **Type the IP address and subnet mask as shown in the following example:**



6. **Click Add.**

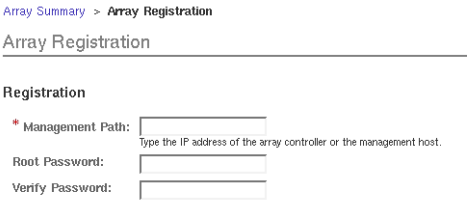
   The new IP address is added to the IP addresses listing.

7. **Open a command window and try to ping the array, as shown in the following example:**

   > **`ping 192.188.128.101`**

If the `ping` is unsuccessful, try rebooting the server and `ping` the array again.

8. **If the array is alive, log in to the Sun Java Web Console as `root` to add the IP address of the array.**
9. **Click Sun StorEdge 6130 Configuration Service, select the array, and click Register Array.**
10. **Enter the IP address for Controller A and click OK.**



The new IP address is added to the IP addresses listing.

Configuring the IP Address for Windows Server 2003

1. **From the Control Panel, select Network and Dial-Up Connections.**
2. **Select Local Area Connection > Properties > Internet Protocol (TCP/IP).**
3. **Make sure a static IP address is configured, and click Advanced.**
4. **In Advanced TCP/IP Settings, click Add directly below the IP addresses listing.**
5. **Type an IP address that is on the same subnet as Controller A (`192.168.128.101`) and Controller B (`192.168.128.102`).**

   For example, you can use `192.168.128.100` because it is on the same subnet and does not conflict with the controller IP addresses.
6. **Click Add.**

   The new IP address is added to the IP addresses listing.
7. **Log in to the Sun Java Web Console as `root` to register the array.**
8. **Click Sun StorEdge 6130 Configuration Service.**
9. **Click Auto Discovery.**
10. **If the array is not discovered, register the array manually:**

    a. **Click Register Array.**

b. Enter the IP address for Controller A and click OK.

The new IP address is added to the IP addresses listing.

11. **After the array is registered, open a command window and try to ping the array, as shown in the following example:**

    > **`ping 192.168.128.101`**

12. **Remove the temporary subnet you previously set up. See "Deleting the Temporary Subnet" on page 88.**

Next Steps

You are now ready to set up the management software, as described in Chapter 6.

CHAPTER 6

Setting Up the Management Software

This chapter provides an overview of the user interface and the steps required for first time you log in. It contains the following sections:

- "Starting the Management Software" on page 93
- "Setting up the Array" on page 97
- "Setting Up the Management Software" on page 102
- "Setting Up the Sun Storage Automated Diagnostic Environment" on page 108
- "Connecting Sun SRS Net Connect 3.1" on page 112
- "Next Steps" on page 112

Starting the Management Software

The Sun StorEdge 6130 array provides two interfaces for accessing the configuration and monitoring software:

- A remote command-line interface (CLI) that enables you to run commands interactively from an out-of-band management station, or write scripts to automate certain administrative tasks.

For access instructions, see "Logging In and Out Using the CLI" on page 94.

- A browser interface (BI) for running the graphical interface on any management host that is connected to the site LAN. The Web-based BI is the primary interface for configuring, managing, and monitoring the system.

For access instructions, see "Logging In using the Browser Interface" on page 95.

User Roles

The type of user role you assign determines the level of system access for each user. TABLE 6-1 describes the two user roles and corresponding default passwords available in the remote CLI. Refer to the Solaris System Administration documentation for information on assigning user roles.

TABLE 6-1 User Roles

User Role	Description	Default Password
`storage`	A `storage` user can use the software features related to storage device configuration and array management.	`!storage`
`guest`	A `guest` user has read-only privileges and can only view information. This user cannot modify any settings or features.	`!guest`

Multiple users assigned to the storage role can be logged in concurrently. However, because the storage users have write privileges, there is a risk of one's changes overwriting another user's previous changes. Therefore, you should develop policies about who can make changes and how to notify others.

For information on how to change the default password for the storage or guest roles, see the online help system.

Logging In and Out Using the CLI

The following explains how to log in and out from a remote host using the CLI. Do so by either remotely logging in to a management software station, or using the Solaris remote client on a remote host.

1. **Access the /`opt/SUNWsesscs/cli/bin` directory:**

   `cd /opt/SUNWsesscs/cli/bin`

Note – Be sure to add the /opt/SUNWsesscs/cli/bin directory to your path.

---

2. **Log in by typing the following command:**

   `% sscs login -h SE-6130-hostname [t] [f] -u` `username`

where:

SE-6130-hostname is the host machine where you installed the software

username is one of the user roles on the SE-6130-host machine (storage or guest)

3. **Enter the password at the system prompt:**

```
!password
```

where:

!password is the default password for the user name (!storage, or !guest)

TABLE 6-2 describes the optional arguments associated with the `sscs login` command for the Sun StorEdge 6130 array:

TABLE 6-2 `sscs login` Command-Line Optional Arguments

Argument	Description
`-f`	Forces a login if another user with the same user name is already logged in. The duplicate user is then logged off.
`-t`	Log in using an HTTP connection.

You can now enter the CLI commands that enable you to perform the same software operations as those available on the Web browser. Refer to the sscs(1M) man page for more information. The man pages are located in /opt/se6x20/cli/man.

Note – Unless you update your MANPATH variable or use the -m option on the man command, you will be unable to locate the sccs man page.

---

4. **Log out using the CLI by typing.**

```
# sscs logout
```

Logging In using the Browser Interface

You can start the management software on any system that is connected to the user LAN.

1. **Open a supported browser.**

Tip – For information about supported web browsers, see the *Sun StorEdge 6130 Array Release Notes*.

---

2. **Enter the IP address of the management host using this format:**

   `https://`*management-host*`:6789`

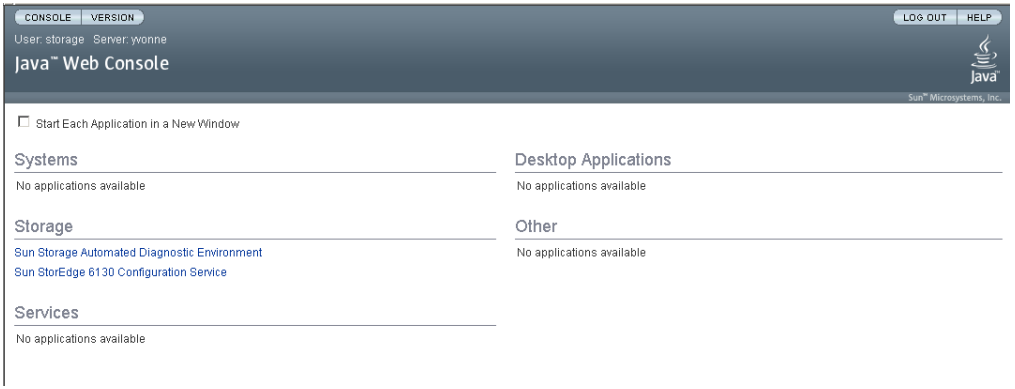
   management-host is the IP address of the machine where you installed the Sun StorEdge 6130 management software.

   The login page is displayed:

3. **Enter `root` for the user name and the root password of the machine on which you installed the software.**

4. **Click Log In.**

The Java Web Console page is displayed:



The Java Web Console page provides two entry points:

- Sun Storage Automated Diagnostic Environment
- Sun StorEdge 6130 Configuration Service

When you select one of the entry points, the appropriate page is displayed.

At this point, you are logged in to the system. Before you begin configuring the system, you should become familiar with the components of the BI and how to get help.

Note – The connection closes automatically if there is no activity for 30 minutes.

Setting up the Array

This section describes the tasks for setting up the array and includes the following topics:

- "Navigating the User Interface" on page 98
- "Discovering and Registering Arrays" on page 102
- "Naming an Array" on page 103
- "Setting the Array Password" on page 104
- "Setting the System Time" on page 106
- "Adding New Users" on page 106
- "Enabling Premium Features" on page 108

For more information about the management software, you can click the Help button at the top right corner of any window. The online help system is context sensitive and will display help for the current page. The help system also provides conceptual, procedural, and reference information. You can use the Table of Contents, Index, and Search tabs to locate help topics that contain information you are looking for.

Navigating the User Interface

This section describes the user interface elements and navigation methods. It includes the following topics:

- "About the Browser Interface" on page 98
- "Getting Help" on page 101

About the Browser Interface

The Sun StorEdge 6130 array browser interface is the main interface for the system (FIGURE 6-1).

This section describes the main elements of the browser interface:

- Access buttons
- Quick status displays
- Navigational tabs
- Page content and actions

Access Buttons

The access buttons are located across the top of the web page and enable you to access some of the most common functions and displays.

FIGURE 6-1 Access Buttons

The access buttons have the following functions:

- **Console** returns you to the Java Web Console page.
- **Version** displays version information.
- **Log Out** logs you out of the system and returns you to the Java Web Console login page.

- **Help** opens the online help system.

Quick Status Displays

The quick status displays provide user role and server name information, as well as the status of current alarm.

FIGURE 6-2 Quick Status Displays

The displays provide the following information:

- The display on the left shows the current user role and server name.
- The display on the right shows the current status of the system, including the number of current users logged in, date and time of the last software update, and current alarms.

For a description of the alarm symbols, see the Sun Storage Automated Diagnostic Environment online help. Click the Search tab and type `controls and indicators`.

Navigational Tabs

You use the navigational tabs to move between web pages to view, configure, manage, and monitor the system.

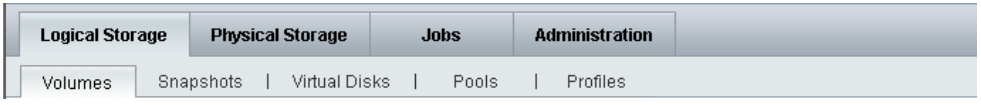


FIGURE 6-3 Navigational Tabs: Sun StorEdge 6130 Configuration Service

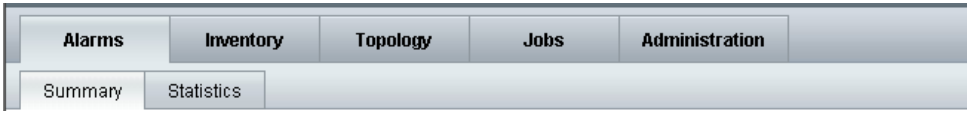


FIGURE 6-4 Navigational Tabs: Sun Storage Automated Diagnostic Environment

Page Content and Actions

The content part of each page (FIGURE 6-5) displays system information and provides a method for performing actions that allow you to administer, manage, monitor, and service the system.

You can click links on each page to display more detailed information about a storage component or device. You can also use BI elements such as icons, buttons, check boxes, and radio buttons to perform system administration and storage management tasks.

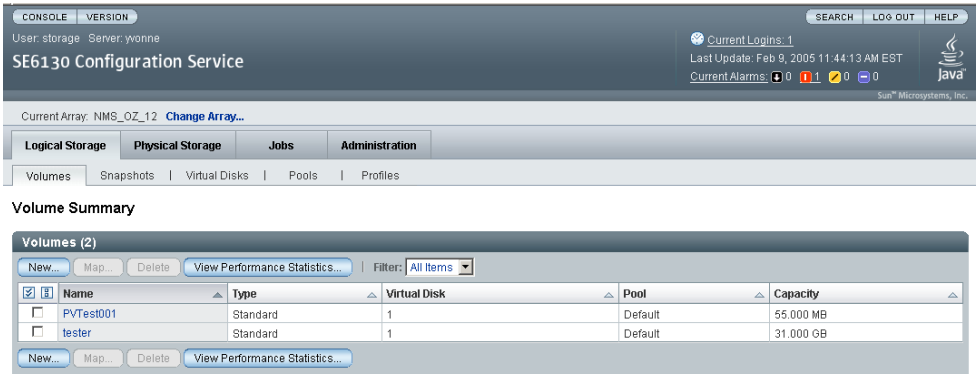


FIGURE 6-5 Page Content and Actions

TABLE 6-3 describes commonly used elements in the content part of the page.

TABLE 6-3 Interface Elements

Element	Description
	Sets the window to scroll or page through displayed data. Click this button to toggle between Page Through Data and Scroll Through Data.
	The column is sorted in ascending (A to Z) order. Click this button to toggle back to sort in descending order.

TABLE 6-3 Interface Elements

Element	Description
	The column in sorted in descending (Z to A) order. Click this button to toggle back to sort in ascending order.
	Selects all data currently displayed. Click this button to select all data.
	Deselects all selected data.

Getting Help

You can access the online help system by clicking the Help button at the top right corner of the page (FIGURE 6-6).

FIGURE 6-6 Help Button

The online help system is context sensitive and will display help for the current page. The help system also provides conceptual, procedural, and reference information. You can use the Table of Contents, Index, and Search tabs to locate help topics that contain information you are looking for.

Setting Up the Management Software

To set up the management software, start by selecting Sun StorEdge 6130 Configuration Service from the Storage section of the Java Web Console page.

The Array Summary page is displayed:

From here you can carry out the setup tasks described in the following subsections, including registering and naming arrays, setting the array local password, setting the system time, adding new users, and enabling premium features.

Discovering and Registering Arrays

If the management host is on the same subnet as the array, you can select Auto Discover to discover the array.

If the arrays are not on the same subnet as the management host, use Register Array to discover the array.

Auto Discovering an Array

Auto discovery is the process of finding arrays on a subnet.

1. **On the Array Summary page, use Auto Discover to discover any array on the subnet.**

   When you click Auto Discover, the management software detects the array you installed and adds it to the Array Summary page.

Note – It takes approximately 2 minutes for the software to discover each array.

---

2. **Verify that the array is added to the Array Summary page.**
3. **If the array does not appear on the Array Summary page, do one of the following:**
   - Check the array status using the `ping` command.
   - Check the hardware connections.

   If the array still does not appear, you can register the array manually as described in the next section.

Registering an Array Manually

If the array is not on the same subnet as the management host, use Register Array to discover an array. You can also use Register Array when moving a previously configured array to a new management host.

1. **On the Array Summary page, click Register Array.**

   The Array Registration page is displayed.
2. **Enter the IP address or host name of either Controller A or Controller B.**

   The host name is the DNS name you assign to each controller.The management software will determine the IP address or host name of the other controller once communication with the array starts.

Note – The password of the array is not a required entry. Each array is shipped without a default password. This field is used only in those cases where the array being registered is one that was previously managed and had a set password. To give the array a password, see "Setting the Array Password" on page 104.

---

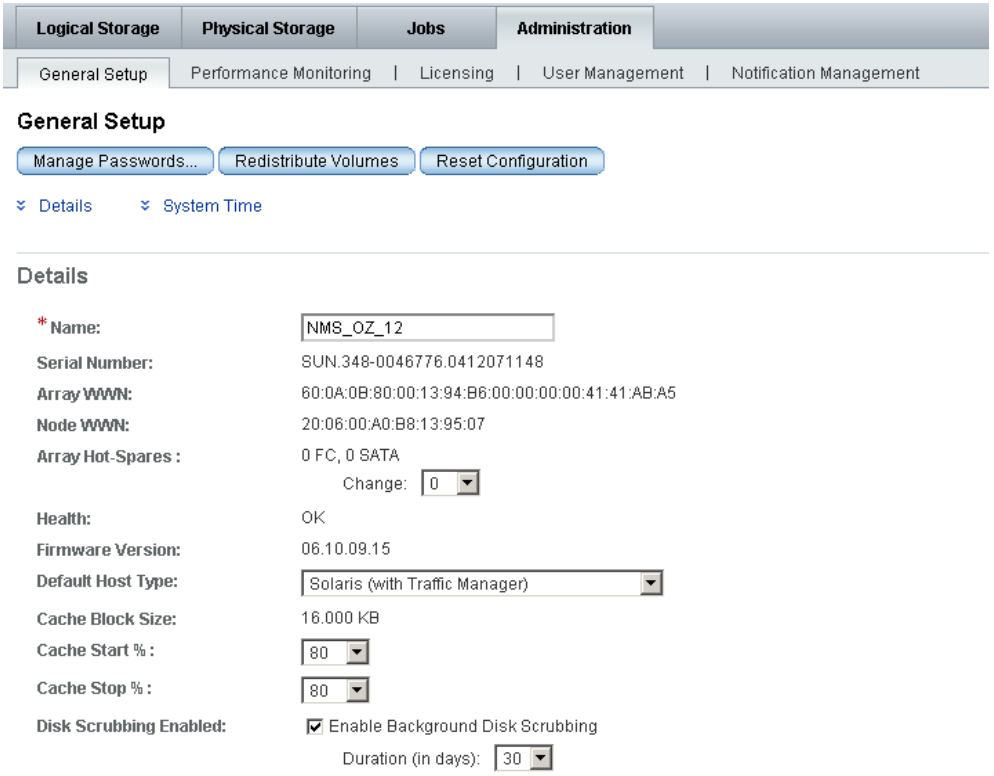
3. **Click OK.**
4. **Verify that the array is added to the Array Summary page.**

Naming an Array

Each array requires a unique name.

1. **On the Array Summary page, click the unnamed array.**
2. **Click the Administration tab.**

The General Setup page is displayed:



3. **In the Name field, enter a unique name consisting of up to 30 characters.**

   The General Setup page contains other features that you may decide to configure. See the online help for more information about the array hot spares, cache start and stop percentages, and disk scrubbing fields.

   Your next step is to set the array password while you are still on the General Setup page.

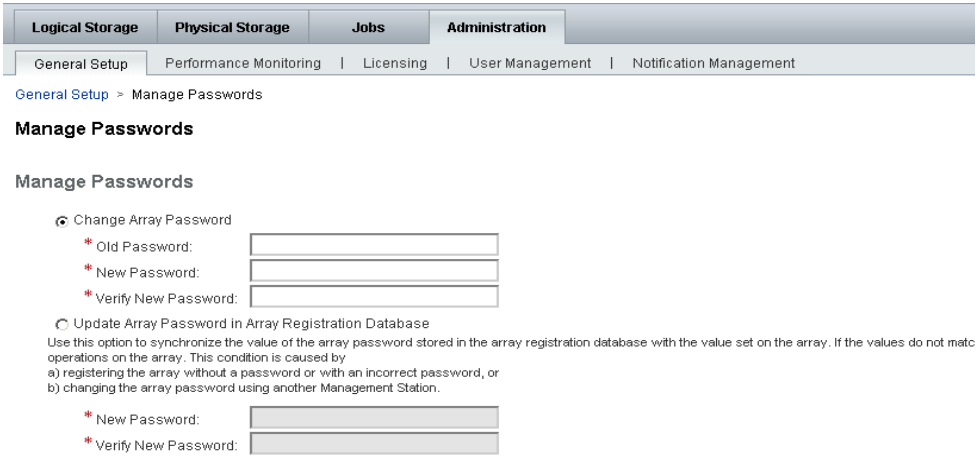
Setting the Array Password

A new Sun StorEdge 6130 array is shipped with a blank, or empty, password field. Sun recommends that you establish an array password during initial setup for security purposes.

To set the array password on a new array:

1. **On the General Setup page, click Manage Passwords.**

   The Manage Passwords page is displayed:



2. **Select Change Array Password.**

3. **Leave the Old Password field blank.**

   This is the only time you can leave this field blank, when you establish a password for a new array.

4. **Enter a new password consisting of up to 30 characters for the array.**

5. **Enter the password again to confirm the new password.**

6. **Click OK.**

   The General Setup page is displayed.

   The management software stores a copy of the array password, known as the local password, on the management host. The Update Local Password field is used only if the array password has been changed by another instance of the management software running on a different management host. For more information about the local password, see the online help.

Note – If you need to change the array password and you do not have the password that was set during installation, contact Sun Service to reset the array password.

Setting the System Time

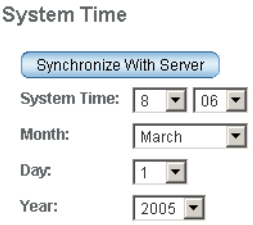
You can also update the system time and date on the General Setup page. When you set the time and date for a selected array, the values are updated for all arrays in the system.

Note that if the array does not use your network's network time protocol (NTP) server, you must do one of the following:

- Click Synchronize with Server to synchronize the time on the array with your Management Host
- Set the time manually

To set the time manually:

1. **On the General Setup page, scroll down to the System Time section:**



2. **Select the current hour and minute according to a 24-hour clock.**
3. **If the date is incorrect, change the month, day, and year to the current date.**
4. **Click OK to save your changes.**

   The General Setup page is refreshed, and `Success` is displayed at the top of the page.

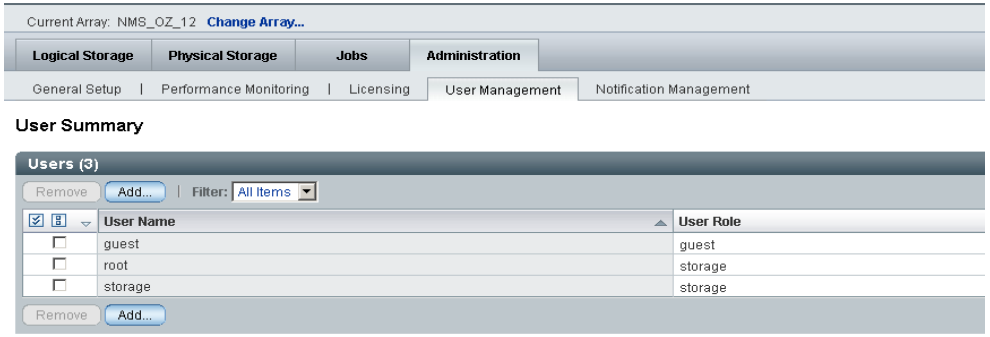
   For more information about the fields and buttons on the General Setup page that you can use after you set up your system, see the online help.

Adding New Users

Before you can add a user and assign that user a role, the user name must be defined in the Solaris Operating System `/etc/passwd` file or NIS.

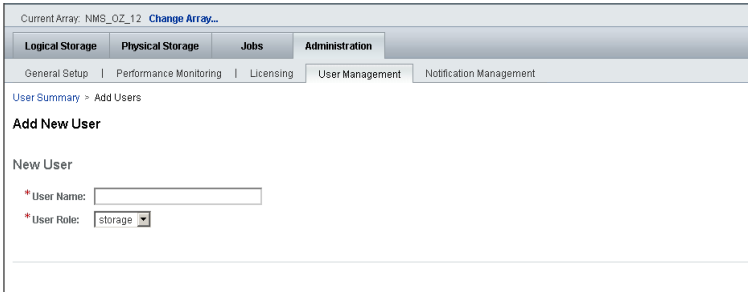
1. **To view a list of users, click Administration > User Management.**

The User Summary page is displayed:



2. **To add a new user, click the Add button.**

   The Add New User page is displayed:



3. **In the User Name field, enter a valid user name.**

   The user name must be defined in the Solaris Operating System `/etc/passwd` file or NIS.

4. **From the User Role list, select the role you want to assign for this user.**

   You can assign a user to one of the following user roles:

User Role	Description
`storage`	Provides full access to all administrative and storage functions and the ability to create, modify, and delete administrative and storage settings.
`guest`	Provides read-only access. A user assigned to the guest role cannot modify any administrative or storage settings.

5. **Click OK.**

   The User Summary page is displayed with a `Success` message, and the name is added to the list.

Enabling Premium Features

License certificates are issued when you purchase premium services. Refer to your license certificate and call the Sun License Center for license information. Refer to `http://www.sun.com/licensing` for your local Sun License Center phone number.

1. **Click the array for which you want to add a new license.**

   The Volume Summary page for that array is displayed.

2. **Click Administration > Licensing.**

   The Licensable Feature Summary page is displayed.

3. **Click Add License.**

   The Add License page is displayed.

4. **Select the type of license you want to add.**

5. **Enter the information provided to you by the Sun Licensing Center and click OK.**

   The license is added to the Licensable Feature Summary page.

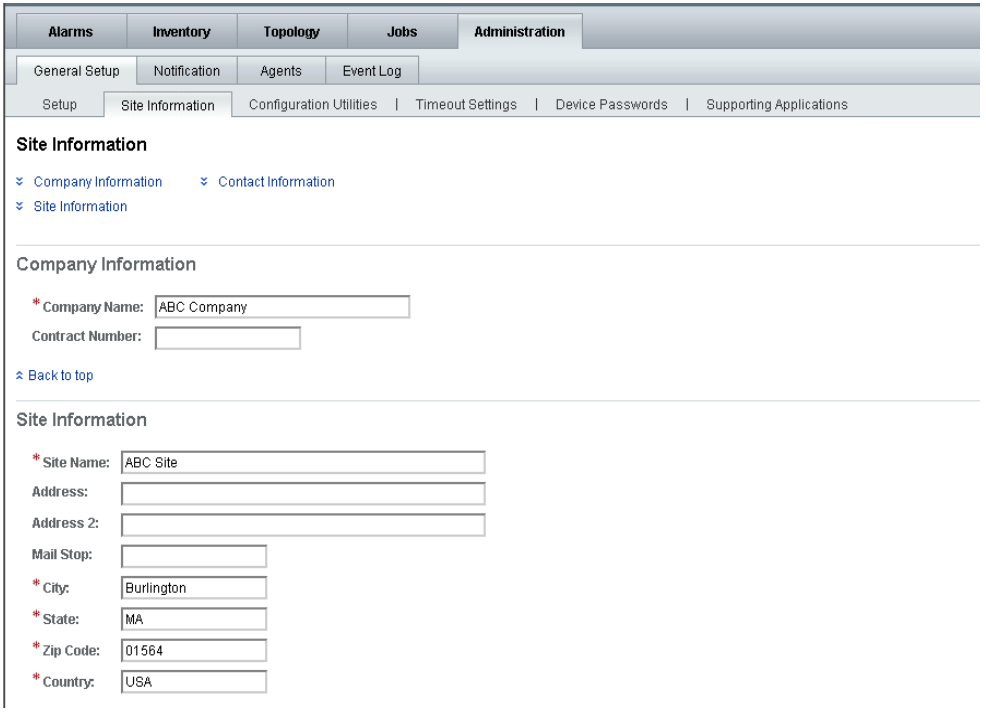
Note – Newly added users should enter the same password for the Web Console that they use in their accounts.

Setting Up the Sun Storage Automated Diagnostic Environment

The Sun Storage Automated Diagnostic Environment software enables you to monitor and diagnose your arrays and storage environment including all Sun SAN devices. See the *Storage Automated Diagnostic Environment Enterprise Edition Release Notes* (part no. 819-0432-nn) for a list of supported devices.

1. **From the Java Web Console page, click Sun Storage Automated Diagnostic Environment.**

   The Site Information page is displayed:

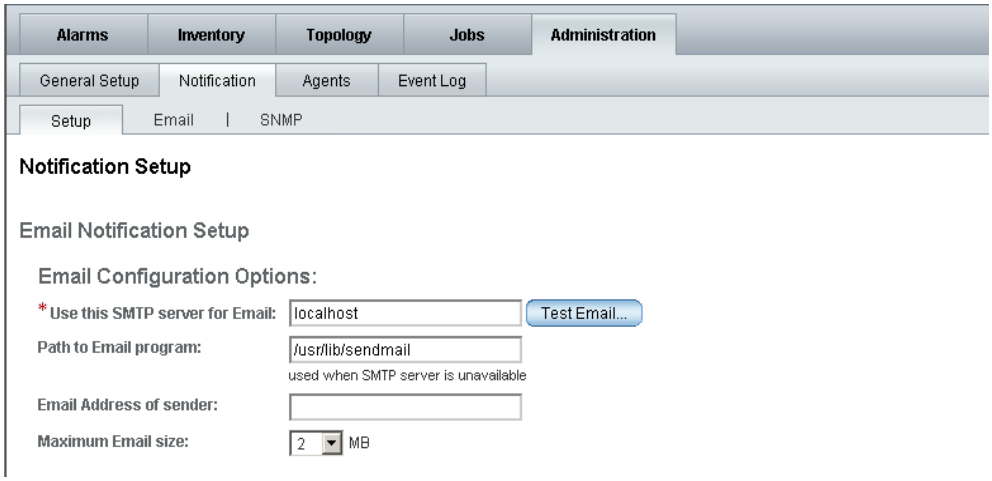


2. **Complete the required company and site information. Click OK.**

   Many parameters have default settings you can accept. If you need help on any of the fields, click the Help button.

3. **Click Administration > Notification.**

   The Notification Setup page is displayed:



4. **Enable local email.**

   a. **Enter the name of the SMTP server.**

      If the host running this software has the `sendmail` daemon running, you can enter `localhost` or the name of this host in the required field.

   b. **Click Save.**

   c. **Click Test Email to send a test email.**

      If you need help on any of the fields, click the Help button.

5. **Set up email notification.**

   a. **Click Administration > Notification > Email.**

   b. **Click New.**

      Enter an email address for local notification. At least one address is required to begin monitoring events. You can customize emails to specific severity, event type, or product type.

   c. **Click Save.**

6. **Set up remote notifications to Sun Microsystems or an enterprise management application.**

   a. **Click Administration > Notification > Setup.**

      The Notification Setup page is displayed.

b. Select one or more providers.

Selections include SUNMC, SRS Net Connect, NSCC, and SNMP. If you need information about any field on the page, click Help.

c. Click Save.

7. Check the devices that have been discovered and their monitoring status.

a. Click Inventory.

The Devices page displays all of the devices that were discovered by the Sun StorEdge 6130 Configuration Service.

b. Verify that all of the expected hosts and devices are listed and that the monitoring status displays Monitored for each device.

8. Discover other supported devices such as SAN switches.

a. Click Discover on the Devices page.

The Discovery page is displayed.

b. Complete the fields on the Discovery page and click Start Discovery.

When the device discovery process is complete, the discovered devices are displayed on the Devices page.

9. Perform optional setup tasks.

- Confirm general setup information
- Add and activate agents
- Specify system timeout settings

For information about these setup tasks, see the online help.

Connecting Sun SRS Net Connect 3.1

The Sun Storage Automated Diagnostic Environment software uses Sun Remote Services (SRS) Net Connect software version 3.1 to send telemetry data to Sun. Download the software from Sun using the instructions at https://srsnetconnect3.sun.com.

Note – Do not download the Sun Storage Automated Diagnostic Environment software that is available from the Sun SRS Net Connect web site. This version is not configured for the Sun StorEdge 6130 array.

Next Steps

Now you are ready to install the data host software, as described in Chapter 7.

CHAPTER 7

Installing Data Host Software

This chapter describes how to install data host software on Solaris hosts and other operating system host platforms. It contains the following sections:

- "Data Host Software Overview" on page 113
- "Preparing for Installation" on page 113
- "Installing Data Host Software for Solaris Hosts" on page 114
- "Installing Data Host Software for Operating Systems Other Than Solaris" on page 119

Data Host Software Overview

The Sun StorEdge 6130 array provides data path support for hosts running Solaris, Windows 2000, Windows Server 2003, Red Hat Linux, HP-UX, NetWare, and SGI IRIX operating systems.

Note – See the *Sun StorEdge 6130 Array Release Notes* for the operating system versions that are supported.

Preparing for Installation

Before installing the data host software, verify the following for each data host:

- Operating system and version are supported as described in the release notes.

- Host bus adapter (HBA) is installed and supported as described in the release notes.
- HBA firmware is at the required level as described in the release notes (HBA drivers are distributed through Sun's Download Center).
- Data hosts are cabled to the array as described in "Connecting Data Hosts" on page 74.

Note – See the *Sun StorEdge 6130 Array Release Notes* for a list of supported operating systems, patches, and HBAs.

Installing Data Host Software for Solaris Hosts

The Solaris data host software is distributed on the Sun StorEdge 6130 Host Installation Software CD.

The Solaris data host software installs the following packages:

- Sun StorEdge SAN Foundation software
- Storage Automated Diagnostic Environment software

Starting the Installation

1. **Log in to the Solaris OS as `root`.**
2. **Insert the Sun StorEdge 6130 Host Installation Software CD into a local drive.**
3. **Change to the `/cdrom/cdrom0` directory:**

   ```
   cd /cdrom/cdrom0
   ```

4. **Start the installation script by typing:**

   ```
   ./install -n
   ```

   The `-n` option specifies a non-interactive installation. After choosing the software you want to install, you will not be prompted to press Return during the installation.

Header information appears and then the following is displayed:

```
                    Host Software Installation
                   ----------------------------

This script installs software for your Sun StorEdge 6130
storage system.

Software components included in this distribution:

        - Sun StorEdge 6130 Data Host Software
        - Sun StorEdge 6130 Management Host Software
        - Sun StorEdge 6130 Remote Management Host Software

You may install any or all of these components on your system.

Sun StorEdge 6130 Remote Management Host Software is a subset of
Sun StorEdge 6130 Management Host Software. You will not be
prompted whether to install the former if the latter is selected.

Do you want to continue? [y/n] :
```

5. **Type** `y` **to continue the installation.**

   You are prompted to select the software package you want to install.

6. **To install the data host, type** `y`**, and then** `n` **as follows:**

```
Do you want to install ....

        Sun StorEdge 6130 Data Host Software [y/n] : y
        Sun StorEdge 6130 Management Host Software [y/n] : n
      Sun StorEdge 6130 Remote Management Host Software [y/n] : n
```

7. **At the following prompt, type `y` to confirm the software you selected:**

   If there is no previous version of StorADE on the system, the prompt appears as follows:.

```
You have chosen to install the following components:


        Sun StorEdge 6130 Data Host Software

Do you want to continue? [y/n] : y
```

   If there is a previous version of StorADE on the system, the prompt appears as follows:.

```
You have chosen to install the following components:


        Sun StorEdge[tm] 6130 Data Host Software

The following component will be upgraded:

        Sun Storage Automated Diagnostic Environment 2.3

Do you want to continue? [y/n] : y
```

   When the installation is complete, a confirmation of the packages you installed is displayed.

   If Sun StorEdge SAN Foundation patches were applied during the installation, you will be asked to reboot the host.

   The date and time that the installation finished and the name of the file containing the installation log are also displayed, as shown in the following example:

```
Finished at: Tue Aug 24 17:58:31 PDT 2004
Note: A log of this procedure has been saved to
/var/sadm/install/se6130/6130_Host_SW_install.log
```

Enabling Multipathing Software

Sun StorEdge SAN Foundation software includes the Sun StorEdge Traffic Manager multipathing software:

1. **Open the** `/kernel/drv/scsi_vhci.conf` **file with a text editor.**
2. **Set** `mpxio-disable=no` **in the file.**
3. **Reboot the host:**

   `reboot -- -r`

Configuring the Data Host Agents

After installing the data host software, enter the following command to configure the Sun Storage Automated Diagnostic software agent on the data host and synchronize it with the master agent on the management host.

The management host software must be installed and the IP address defined before entering this command on the data host:

`/opt/SUNWstade/bin/ras_install`

Note – Only use the `ras_install` command on data hosts, never on the management host that contains the management software with the master agent.

The `ras_install` script displays. Enter the following options:

- **`S`** for the slave agent
- **`IP`** address of management host
- **`C`** to start the Agent cron

The following is the output from a sample `ras_install` script:

```
+---------------------------------+
| Installing the Package and Crons |
+---------------------------------+
? Are you installing a Master or a Slave Agent? (Enter M=master,S=
slave, E=Empty Master) [M/S/E]: (default=M) S

The address of the master must already be defined before a slave
can be installed.
If the master has not been installed yet, abort this install and
go install this package on the host that was selected to be the
master.

? Enter the IP Name/Address of the Master Host Agent 10.x.xx.xxx

- Testing communication with host '10.xx.xx.xxx' ..
- Communication successful.

- Starting the Storage A.D.E service (rasserv):

/opt/SUNWstade/rasserv/bin/apachectl startssl: ./rasserv started

- Setting up crons:
? Do you want to C=start or P=stop the Agent cron [C/P] : (default=
C) C

- cron installed.
- Testing access to rasserv (this test will timeout after 4 tries
of 10 secs):
- ping '10.x.xx.xxx' succeeded!
- 1/4 attempting to contact agent service...

- Contacted agent with hostid=xxcffxxx.
+-------------------------------+
| SUNWstade installed properly |
+-------------------------------+

- Sending monitored device-list to agent at 10.x.xx.xxx
-- diag-xxxx.Central.Sun.xxx already there
OK
```

Installing Data Host Software for Operating Systems Other Than Solaris

The data host software for Red Hat Linux, HP-UX, AIX, NetWare, and SGI hosts is available from the Sun Download Center (SDLC).

See the *Sun StorEdge 6130 Array Release Notes* for a list of supported operating systems, patches, and HBAs.

Downloading the Software

1. **To download the latest version of the software, go to:**

   `http://www.sun.com/download/index.jsp?cat=Systems%20Administration&tab=3&subcat=Storage%20Management`

2. **Select the link for the Sun StorEdge 6130 Array Host Installation software and click Download.**

3. **Log in using your SDLC user name and password.**

   If you have not already registered, click Register Now.

4. **Read and accept the license agreement.**

5. **Select the link for the data host platform that you want to install.**

6. **Save the install package to a temporary directory.**

7. **Uncompress and untar the install package.**

8. **When the download is finished, log out of the SDLC.**

Installing the Software

A `readme` file is provided as part of the installation package.

1. **To install the software, refer to the `readme` file for platform-specific instructions.**

2. **For any post-installation instructions, refer to the *Sun StorEdge 6130 Array Release Notes*.**

CHAPTER 8

Installing Remote Management Software

This chapter describes how to install the remote CLI software on operating system platforms other than Solaris. It contains the following sections:

- "Remote CLI Client Overview" on page 121
- "Preparing for Installation" on page 122
- "Downloading the Software" on page 122
- "Installing the Windows Remote CLI Client" on page 123
- "Installing the Red Hat Linux, HP-UX, and AIX Remote CLI Client" on page 124

Remote CLI Client Overview

The remote command-line interface (CLI) client enables you to configure and monitor the array from hosts other than the management host. You can run commands interactively from a remote client, or write a script to automate certain administrative tasks.

The remote CLI client is available for Windows, Red Hat Linux, AIX, and HP-UX operating environments.

Note – See the *Sun StorEdge 6130 Array Release Notes* for the operating system versions that are supported.

For information about the remote CLI client commands, see the `sscs`(1M) man page.

Preparing for Installation

Before installing the data host software, verify the following for each data host:

- Operating system and version are supported as described in the release notes.
- Host bus adapter (HBA) is installed and supported as described in the release notes.
- HBA firmware is at the required level as described in the release notes (HBA drivers are distributed through Sun's Download Center).
- Data hosts are cabled to the array as described in "Connecting Data Hosts" on page 74.

Downloading the Software

The remote CLI client for operating systems other than Solaris is distributed from Sun's Download Center.

To download the software, follow these steps:

1. **From the host on which you want to install the software, open a browser window and go to Sun's Download Center at:**

   `http://wwws.sun.com/software/download/sys_admin.html`

2. **Click the Sun StorEdge 6130 Host CLI Package for Non-Solaris software link.**
3. **Click Download to access the download window for all operating systems.**
4. **Log in using your customer user name and password.**
5. **Read the license agreement, click Accept, and then click Continue.**
6. **For the AIX, HP-UX, or Linux operating systems, follow these steps:**

   a. **Click the file you want to download.**

      The web browser prompts you to download the file.

   b. **Download to any directory except** `/opt`**.**

   c. **Save the installation package to a temporary working directory after you download it:**

 # cp *install-package*.**tar.Z /***directory*

install-package is the name of the compressed tar file. */directory* is the name of the directory name to which you want to copy the package.

d. Change to the temporary directory:

cd /*directory*

e. Uncompress the tar file.

f. Extract the contents:

tar -xvf *tar-file*.tar

Note – If `checksum` errors occur when you use a platform-specific `tar`, use the GNU version of `tar`.

---

7. For the Windows 2000 or Windows 2003 operating systems, follow these steps:

a. Click the file you want to download.

The web browser prompts you to download the file.

b. Download to any directory.

c. Unzip `Disk1.zip` using any supported zip program.

d. Save the unzipped folder to any directory.

Installing the Windows Remote CLI Client

1. **Download the software for the Windows host as described in "Downloading the Software" on page 122.**
2. **Double-click `setup.exe`.**
3. **Read the license agreement and answer the licensing question.**

   If you accept the licensing agreement, the software is installed on the host.
4. **From the Start menu, click Programs > Accessories > Command Prompt.**
5. **Add `c:\Program Files\Sun Microsystems\SSCS` to your command prompt path.**

The remote CLI client is now installed, enabling you to enter `sscs` commands in the Command Prompt window. For information about the commands, see the `sscs`(1M) man page.

Installing the Red Hat Linux, HP-UX, and AIX Remote CLI Client

1. **Download the remote CLI software for the appropriate operating system as described in "Downloading the Software" on page 122.**
2. **Log in as superuser (`root`).**
3. **Remove any aliases created for the environment (for example, `cp="cp -i"`).**

   If aliases exist in the superuser environment or profile, the software installation and configuration might have unexpected results.

   For the Korn shell: `# unalias -a`

   For the C shell: `> unalias *`
4. **Verify that you have write permissions in `/opt`.**
5. **Run the install script by entering:**

   `./se6x20`
6. **Read the licensing agreement, click Accept, and then click Continue.**

   When you accept the licensing agreement, the software is installed in `/opt/se6x20` on the host.
7. **Add `/opt/se6x20/bin` to your path.**
8. **Enter `/opt/se6x20/bin/sscs` at the command line.**

   The remote CLI client is now installed. For information about the commands, see the `sscs`(1M) man page.

CHAPTER 9

Planning Your Storage Configuration

This chapter introduces you to the Sun StorEdge 6130 array storage components. It contains the following sections:

- "Storage Array Configuration Components" on page 125
- "Storage Configuration Considerations" on page 129
- "Allocating Storage to Data Hosts" on page 129

For more information about the concepts introduced in this chapter, see the appropriate topic in the online help.

Storage Array Configuration Components

The array management software provides access to both physical and logical storage components. The physical components of a storage array are as follows.

- **Host –** A server, or data host, with one or more initiators that can store data on an array. You can define volume-to-LUN mappings to an individual host or assign a host to a host group.
- **Host group –** A collection of one or more data hosts. A host can be part of only one host group at a time. You can map a host group to one or more volumes to enable the hosts in the group to share access to a volume.
- **Initiator –** A port on a Fibre Channel (FC) host bus adapter (HBA) that allows a host to gain access to the storage array. The initiator has a World Wide Name (WWN) that is globally unique.
- **Tray –** An enclosure that contains from 5 to 14 disks.
- **Disk –** A non-volatile, randomly addressable, rewriteable data storage device. Physical disks are managed as a pool of storage space for creating volumes.

The logical components of a storage array are as follows:

- **Storage domain –** A logical entity used to partition storage. By default, users get 8 storage domains. You can then purchase licenses to increase this number to either 16 or 64.
- **Profile –** A set of attributes that are used to create a storage pool. The system has a predefined set of storage profiles. You can choose a profile suitable for the application that is using the storage, or you can create a custom profile.
- **Pool –** A collection of volumes with the same configuration. A storage pool is associated with a storage profile, which defines the storage properties and performance characteristics of a volume.
- **Virtual disk –** One or more physical disks that are configured with a given RAID level (or RAID set).
- **Volume –** A container into which applications, databases, and file systems store data. Volumes are created from virtual disks, based on the characteristics of a storage pool. You map a volume to a host or host group.
- **Snapshot –** A point-in-time copy of a primary volume. The snapshot can be mounted by an application and used for backup, application testing, or data mining without requiring you to take the primary volume offline. Snapshots are a premium feature that require a right-to-use license.

For additional information on physical and logical components, refer to the online help.

FIGURE 9-1 shows the relationship of logical and physical storage components.

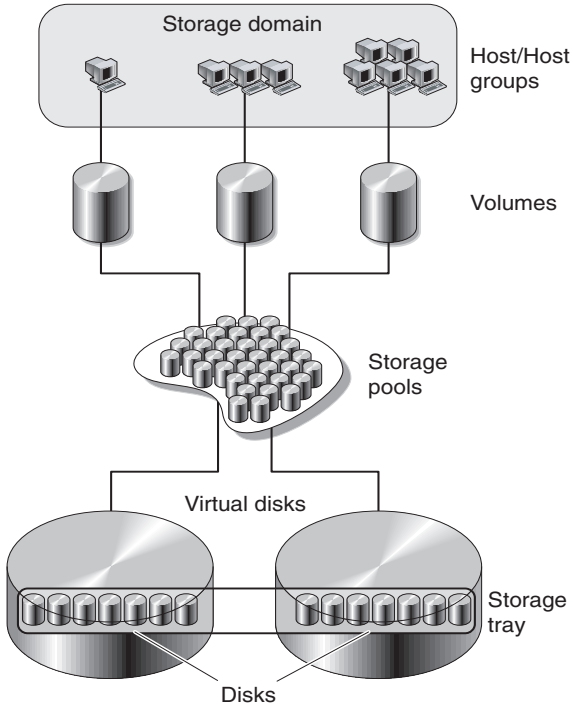


FIGURE 9-1 Logical and Physical Storage Components

Partitioning Storage Using Storage Domains

Storage domains enable you to partition storage, allowing hosts or host groups access to specific volumes. Hosts access volumes on the array through the physical host ports (or initiators) residing on host HBAs. Volume-to-LUN mapping allows you to specify the host or host group that can access a specific volume on your storage array. For more information about storage domains and LUN mapping, see the online help.

FIGURE 9-2 shows how storage domains can be used to partition storage. It depicts a storage array configured with three storage domains, Storage Domain 1, Storage Domain 2, and Storage Domain 3.

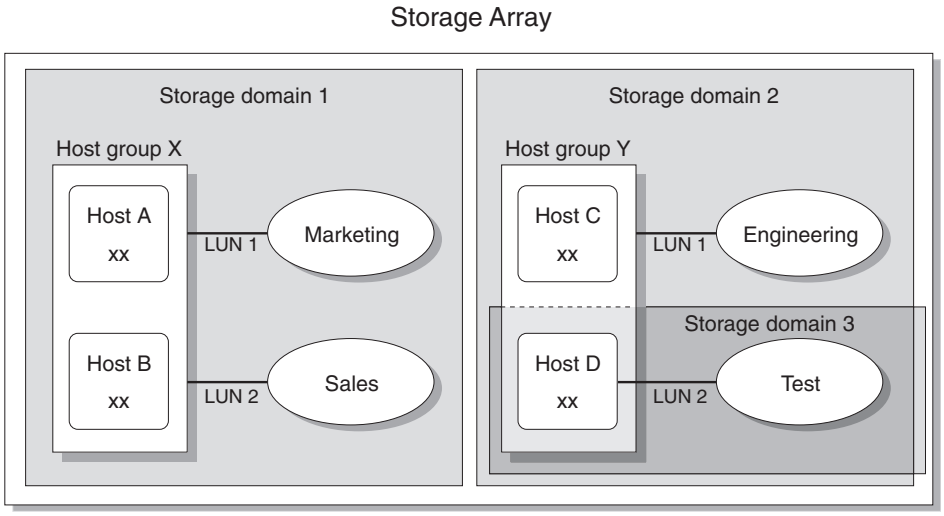


FIGURE 9-2 Storage Array With Three Domains

Storage Domain 1 consists of two volumes, Marketing and Sales, that are mapped to Host Group X. Host Group X contains two hosts, Host A and Host B. All initiators associated with Host A and Host B, within Host Group X, have access to volume Marketing by way of LUN ID 1, and to volume Sales by way of LUN ID 2.

Storage Domain 2 consists of one volume, Engineering, that is mapped to Host Group Y. Host Group Y contains two hosts, Host C and Host D. By virtue of being associated with any host within Host Group Y, all initiators associated with Host C and Host D have access to volume Engineering by way of LUN ID 1.

Storage Domain 3 consists of one volume, Test, that is mapped to Host D. All initiators associated with Host D have access to volume Test by way of LUN ID 2. Note that Host D is a member of Host Group Y; however, since volume Test is mapped directly to Host D and not to Host Group Y, Host D is the only member of Host Group Y that can access volume Test.

Note – LUN IDs must be unique within a storage domain.

Storage Configuration Considerations

When configuring a storage array, you need to determine how to organize and allocate the total storage capacity into volumes and share those volumes among your data hosts. As you plan your storage configuration, it is important that you consider the following requirements for your site:

- **Performance requirements** – You can optimize I/O activity by selecting a predefined storage profile with different characteristics or by creating a custom profile.
- **Access requirements** – You can use storage domains to organize and allocate storage so that only certain hosts have access to volumes. Volumes in a storage domain can be accessed only by host and host groups that are in the same storage domain. You can associate a storage domain with individual hosts or a host group.

The Sun StorEdge 6130 array software is configured with a default storage profile, storage pool, and storage domain:

- The default storage profile configures associated volumes to have a RAID-5 RAID level, 512-Kbyte segment size, enabled read-ahead mode, FC disk type, and a variable number of drives.
- The default storage pool uses the Default profile (RAID-5) and groups all volumes with the same storage characteristics, as defined by the storage profile.
- The default storage domain has no restrictions and allows all hosts and host groups to share access to the same volumes. If you want to restrict access to volumes from certain hosts, you should use storage domains.

You must plan your configuration to determine what storage profile and storage pool to use. For more information, see Planning Volumes in the online help.

Allocating Storage to Data Hosts

Before you create a volume, you should have a plan for how you want to allocate your storage. You should know the number of data hosts you are configuring and the storage capacity and performance needs of each data host.

The New Volume wizard guides you through the steps for creating a volume. When you create a volume, the wizard prompts you to enter or select the following information:

- Volume name and capacity

- A storage pool, which is associated with a storage profile
- The mode in which virtual disks will be created
- Optionally, a mapping from the volume to a host or host group

Configuring Storage on the Array

This section describes how to start to configure storage on the array. It guides you through the following steps:

- "Logging In" on page 130
- "Selecting a Profile" on page 131
- "Creating Hosts and Host Groups" on page 132
- "Creating an Initiator" on page 133
- "Creating a Storage Pool" on page 134
- "Creating a Volume and Mapping It to a Host or Host Group" on page 135

Logging In

1. **Open your browser and enter the IP address of the management host using this format:**

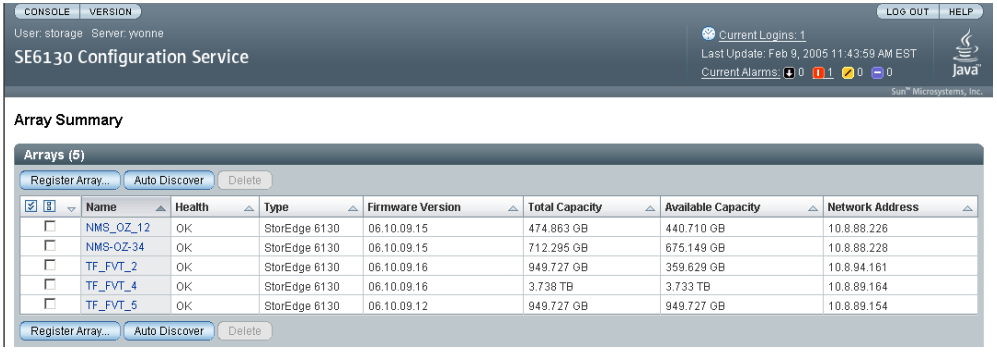
   `https://`*IP-address-management-host*`:6789`**

2. **Log in as a user with the `storage` role.**

   The Java Web Console page is displayed.

3. **Click Sun StorEdge 6130 Configuration Service.**

   The Array Summary page is displayed.



Selecting a Profile

The Sun StorEdge 6130 array provides several storage profiles that meet most storage configuration requirements. If the Default storage profile does not meet your performance needs, you can select one of several other predefined profiles, or you can create a custom profile.

To view the predefined storage profiles:

1. **On the Array Summary page, click the array you want to configure.**

   The Volume Summary page is displayed.

2. **Click Storage > Profiles.**

   The Storage Profile Summary page is displayed.

   TABLE 9-1 describes the characteristics of the predefined storage profiles.

TABLE 9-1 Sun StorEdge 6130 Array Predefined Storage Profiles

Name	RAID Level	Segment Size	Read-Ahead Mode	Drive Type	Number of Drives
Default	RAID-5	512 KB	Enabled	FC	Variable
High Capacity Computing	RAID-5	512 KB	Enabled	SATA	Variable
High Performance Computing	RAID-5	512 KB	Enabled	FC	Variable
Mail Spooling	RAID-1	512 KB	Enabled	FC	Variable
NFS Mirroring	RAID-1	512 KB	Enabled	FC	Variable
NFS Striping	RAID-5	512 KB	Enabled	FC	Variable
Oracle DSS	RAID-5	512 KB	Enabled	FC	Variable
Oracle OLTP	RAID-5	512 KB	Enabled	FC	Variable
Oracle OLTP HA	RAID-1	512 KB	Enabled	FC	Variable
Random 1	RAID-1	512 KB	Enabled	FC	Variable
Sequential	RAID-5	512 KB	Enabled	FC	Variable
Sybase DSS	RAID-5	512 KB	Enabled	FC	Variable
Sybase OLTP	RAID-5	512 KB	Enabled	FC	Variable
Sybase OLTP HA	RAID-1	512 KB	Enabled	FC	Variable

3. **Select a profile that matches your storage requirements.**

   You will need the name of the storage profile later, when you create a storage pool.

Note – If you want to create a custom profile, click New on the Storage Profile Summary page. If you need information about any of the fields, click Help.

Creating Hosts and Host Groups

Host groups enable you to designate a collection of hosts that will share access to a volume. You can map volumes to a host group or to individual hosts that have a logical unit number (LUN).

If you have many hosts to create, you may find it easier to create the hosts first and then to add the hosts to a host group.

Creating Hosts

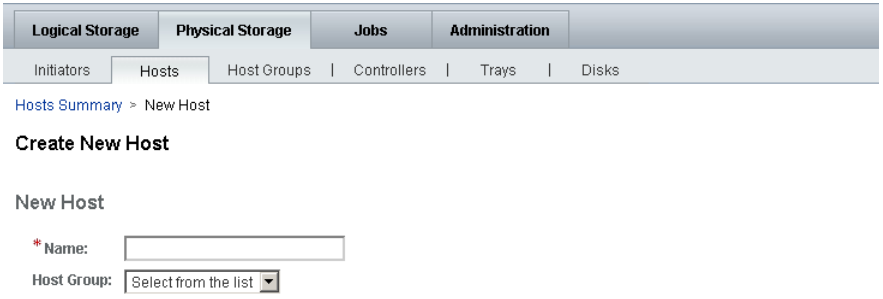
Follow these steps for each data host to which you wish to assign storage.

1. **Click Physical Storage > Hosts.**

   The Host Summary page is displayed.

2. **Click New.**

   The Create New Host page is displayed:



3. **Type a name for the new host, using a maximum of 30 characters.**

   Use a name that will allow you to recognize the data host on your network.

4. **If host groups have already been created, you can assign the new host directly to a host group.**

5. **Click OK.**

   The host is created and added to the Host Summary page.

Creating a Host Group

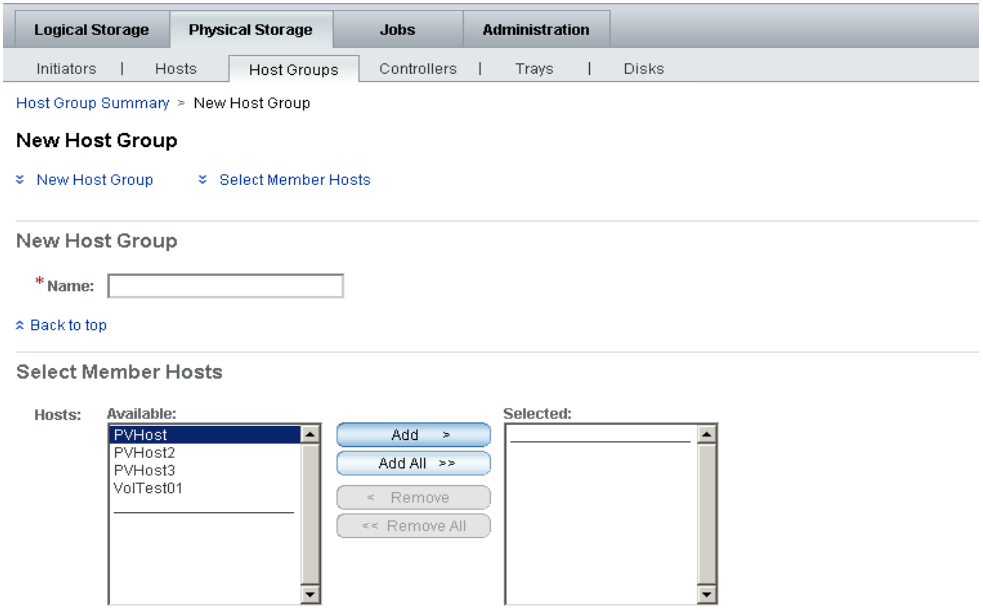
This is optional and is something you typically use for clusters.

1. **Click Physical Storage > Host Groups.**

   The Host Group Summary page is displayed.

2. **Click New.**

   The New Host Group page is displayed:



3. **Enter a name for the new host group, using a maximum of 30 characters.**

4. **Double-click the names of the available hosts you want to add to the group. You can also click Select All or Remove All to add or remove all of the available hosts.**

5. **Click OK.**

   The new host group is created and added to the Host Group Summary page.

Creating an Initiator

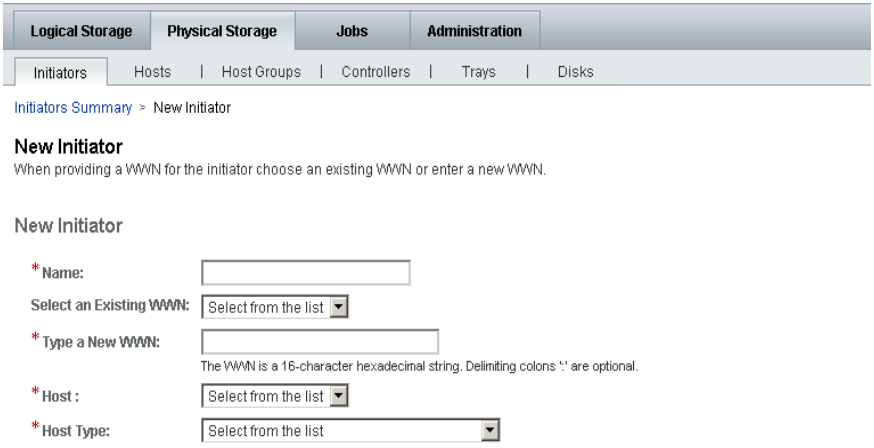
To make storage available to a data host or host group, you create an initiator and associate it with a volume. An initiator is an FC port that is identified by a unique World Wide Name (WWN) of a host bus adapter (HBA) installed on the data host. You will need the WWN for the initiator that you want to associate with a volume.

1. **Click Physical Storage > Initiators.**

   The Initiator Summary page is displayed.

2. **Click New.**

   The New Initiator page is displayed:



3. **Enter a name for the new initiator, using a maximum of 30 characters.**

4. **Select an existing WWN, or enter a new WWN.**

   If you enter the WWN, the delimiting colons (:) of the 16-character hexadecimal WWN are optional.

5. **Select the host name for the new initiator.**

6. **Select the host type for the new initiator.**

7. **Click OK.**

   The Initiator Summary page displays the initiator name, host name, host type, and WWN of the new initiator.

Creating a Storage Pool

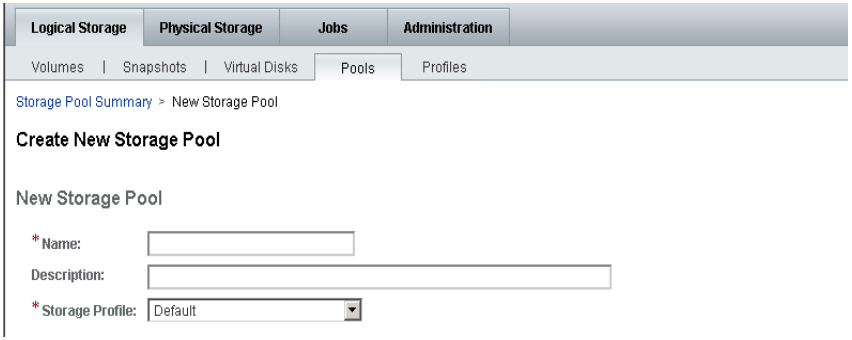
A storage pool is a collection of volumes with the same configuration.

1. **Click Logical Storage > Pools.**

   The Storage Pool Summary page is displayed.

2. **Click New.**

   The Create New Storage Pool page is displayed:



3. **Enter a name for the new storage pool, using a maximum of 30 characters.**

4. **Select Default or another predefined storage profile that meets your storage needs.**

   See "Selecting a Profile" on page 131.

5. **Click OK.**

   The new storage pool is displayed on the Storage Pool Summary page.

Creating a Volume and Mapping It to a Host or Host Group

A volume is a "container" into which applications, databases, and file systems can store data. A volume is created from virtual disks that are part of a storage pool. Based on your selections, the array automatically allocates storage from different disks to meet your volume configuration requirements.

The New Volume wizard guides you through the steps for creating a volume.

1. **Click Logical Storage > Volumes.**

   The Volume Summary page is displayed.

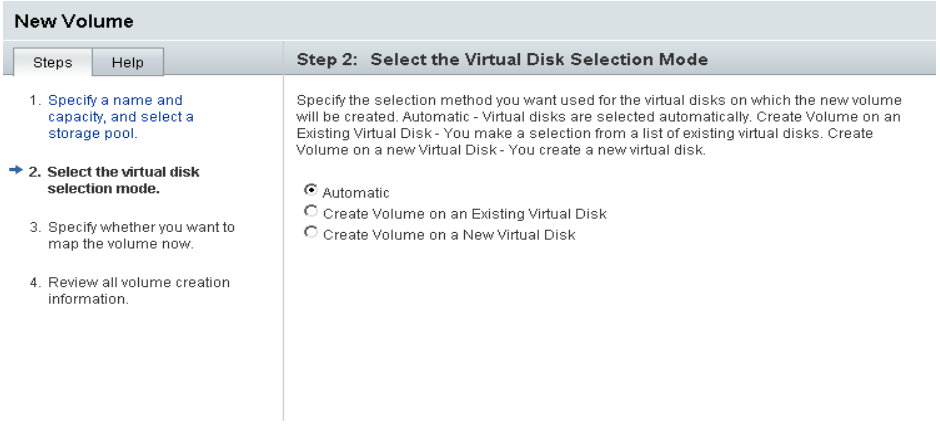
2. **Click New.**

   The New Volume wizard is displayed.

3. **Enter a name and capacity for the volume, and select the storage pool with which you want it to be associated. Click Next.**

- The volume name can consist of a maximum of 30 characters.
- The volume capacity equals the amount of virtual disk space to be used.
- The storage pool you select is associated with a storage profile, which determines the volume's storage characteristics.

4. **Select the method you want to use to create a virtual disk, and click Next.**



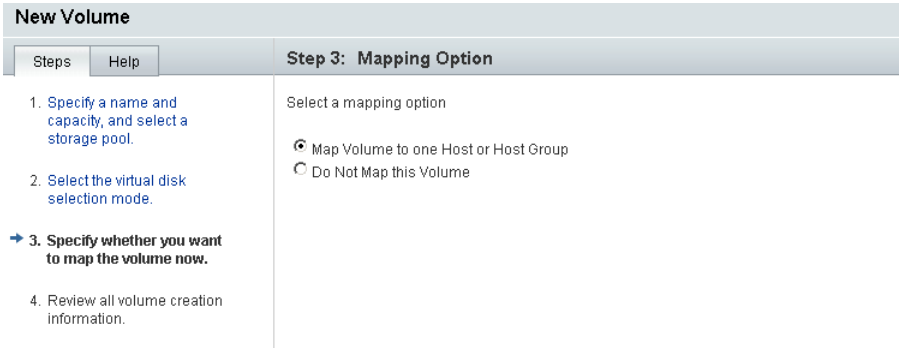
The options are:

- **Automatic** – The software assigns the physical disks to be used based on the profile.
- **Create Volume on an Existing Virtual Disk** – You are prompted to select a virtual disk from a list of available virtual disks and their characteristics, including RAID level, capacity, and maximum volume size.

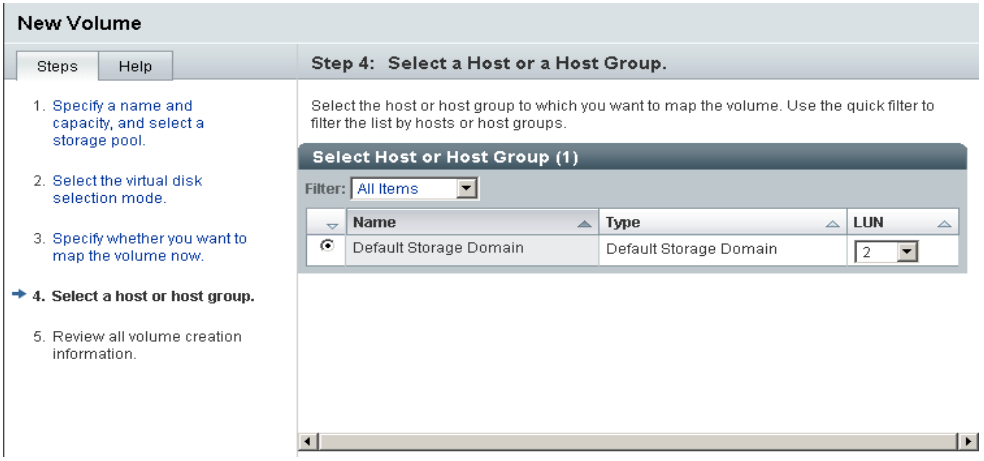
- **Create Volume on a New Virtual Disk** – You create a new virtual disk by specifying the number of physical disks, or by selecting from a list of available disks.

5. **To map the volume now, select Map Volume to one Host or Host Group, and click Next.**

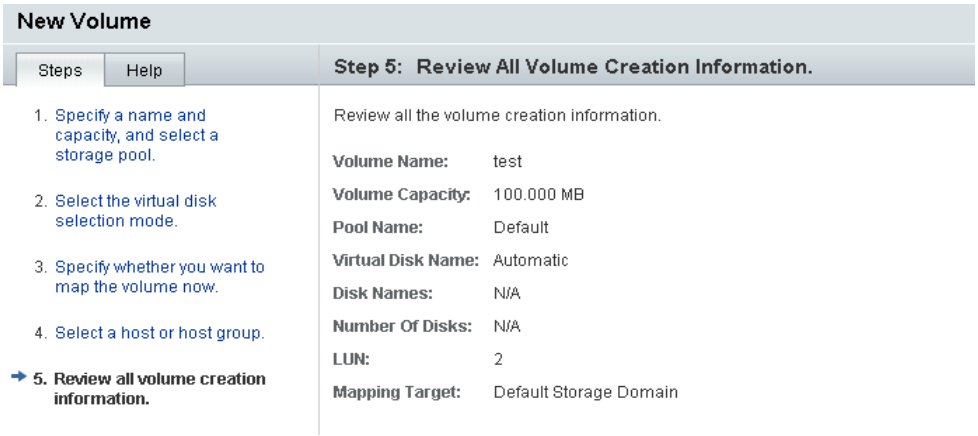
   If you select Do Not Map this Volume, you can map the volume after it is created. See the online help for more information about mapping a volume after a volume is created.



6. **Select the name of a host or host group to which you want to map the volume, and click Next.**



7. **Review your selections for this volume.**



8. **If the values are correct, click Finish.**

   If you want to change any selections, click Previous to go back to the step that you want to change, or click Cancel to start again.

   After you click Finish, the new volume is displayed on the Volume Summary page.

APPENDIX **A**

Configuration Worksheets

Use the worksheets in this appendix to help you collect the information that you will need to perform the installation. Two worksheets are provided:

- "Sun StorEdge 6130 Array Configuration Worksheet" on page 140
- "Sun StorEdge 6130 Array Data Host Information" on page 141

TABLE A-1 lists the information you need to configure the array.

TABLE A-1 Sun StorEdge 6130 Array Configuration Worksheet

Controller A MAC address:	
Controller B MAC address:	
Controller A IP address:	
Controller B IP address:	
Management host IP address:	
Network mask:	
Name server domain name:	
IP address of the domain name server (DNS):	
Gateway IP address:	
Email notification address:	

TABLE A-2 lists the information you need to collect for each data host connected to the Sun StorEdge 6130 array.

TABLE A-2 Sun StorEdge 6130 Array Data Host Information

Host name:	
Vendor:	
Model:	
Operating system:	
Patch/Service pack:	
Number of HBAs:	
HBA World Wide Name (WWN):	
HBA model:	
HBA driver:	

CHAPTER B

Configuring a DHCP Server

This appendix describes how to configure BOOTP services in a Sun Solaris and Microsoft Windows environment. It contains the following sections:

- "Before You Begin" on page 143
- "Setting Up a Solaris DHCP Server" on page 143
- "Setting Up a Windows 2000 Advanced Server" on page 148

Dynamic IP addresses are assigned through DHCP server BOOTP services.

Before You Begin

You need each controller's MAC address to configure the DHCP server. The MAC address is located on the bar code label at the back of each RAID controller. Since there are two controllers per array, you need two MAC addresses.

Setting Up a Solaris DHCP Server

The following procedure provides an example of how to set up a DHCP server with the BOOTP option for the Solaris 8, 9, and 10 Operating Systems. Your environment may require different steps.

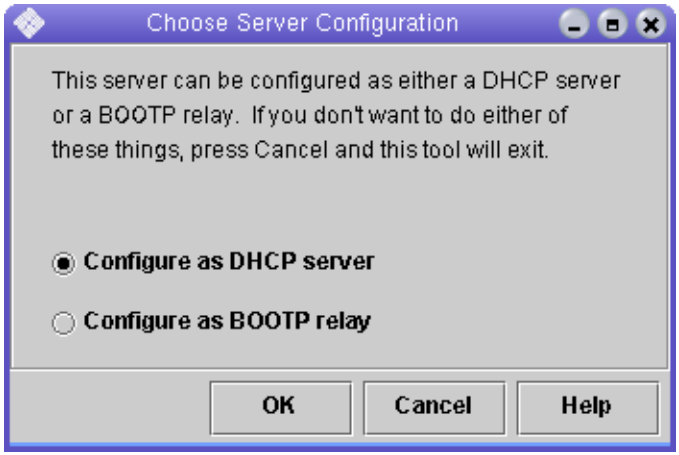
1. **Modify the `netmasks` line of the `/etc/nsswitch.conf` file as shown here:**

```
#netmasks:    nis [NOTFOUND=return] files
netmasks:    files nis [NOTFOUND=return]
```

2. **Start the DHCP wizard by entering the following command at the command line:**

```
/usr/sadm/admin/bin/dhcpmgr &
```

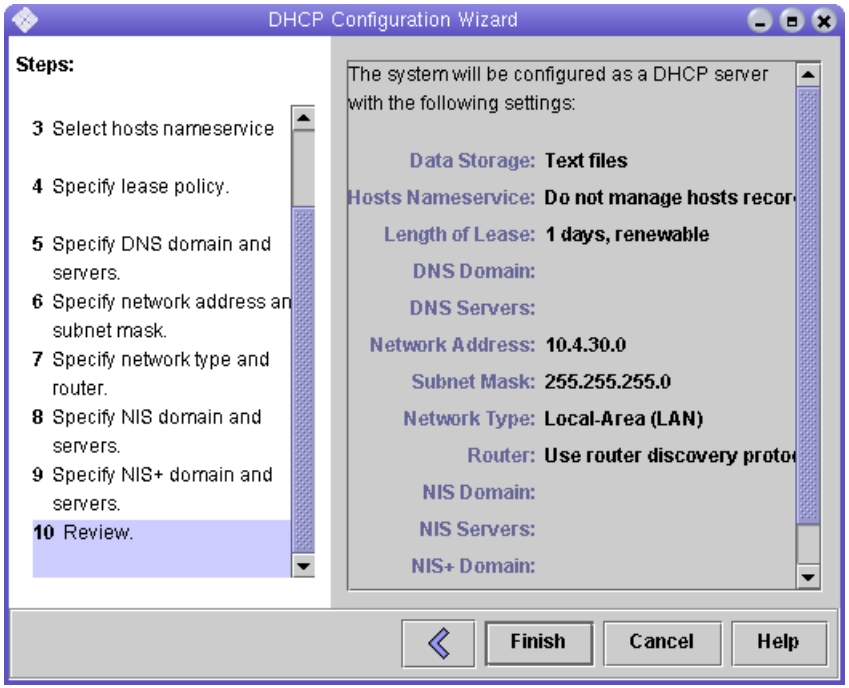
The following window is displayed:



The wizard will prompt you for information related to the configuration, network address, and subnet mask of the controller tray. Select or enter the following information:

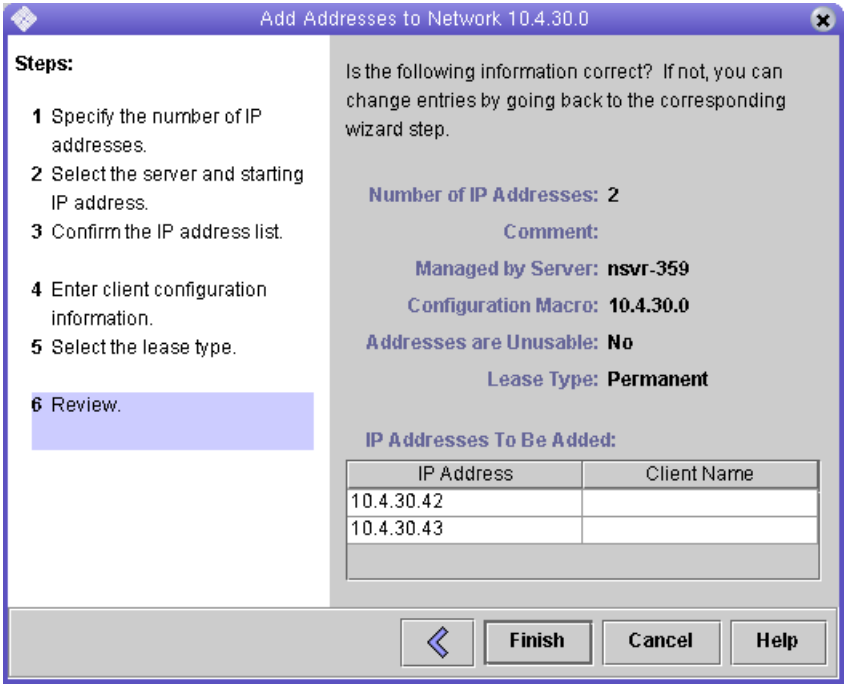
- Data storage format: **`Text files`**
- Nameservice to store host records: **`Do not manage hosts records`**
- Length of lease:
- Network Address: *Network address of Controller A*
- Subnet Mask: For example, `255.255.255.0`
- Network Type: **`Local-Area (LAN)`**
- Router: **`Use router discovery protocol`**

Your summary page should look similar to the following example:



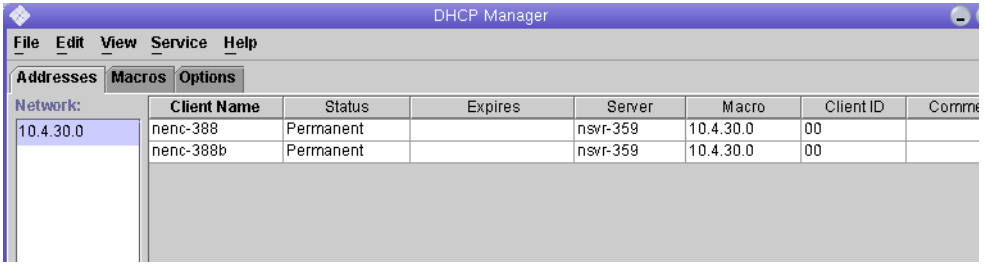
3. **Verify your configuration information and click Finish.**
4. **When you are prompted to configure addresses for the server, click Yes.**
   The Add Address to Network wizard is displayed.
5. **Enter the following information:**
   - Number of IP addresses
   - Name of managing server
   - Starting IP address
   - Configuration macro to be used for configuring the clients
   - Lease type

Your summary page should look similar to the following example:



6. **Verify your configuration information and click Finish.**

   The DHCP Manager displays the following:

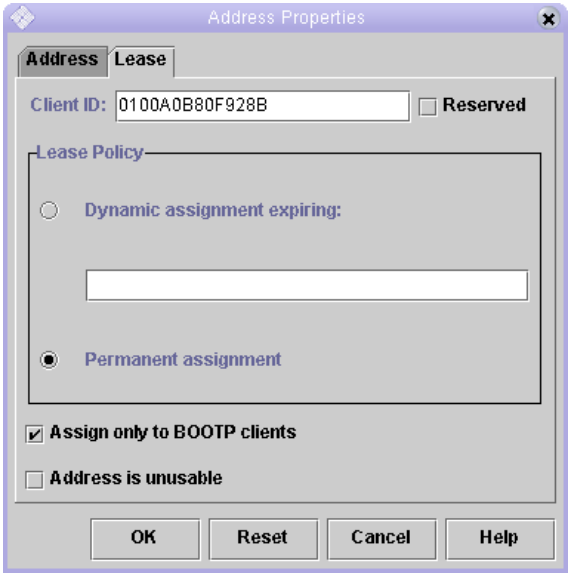


7. **In the Address Properties window, do the following for each RAID controller:**

   a. **In the Client ID field, enter `01` followed by the MAC address that is printed on the back of the RAID controller. For example:**

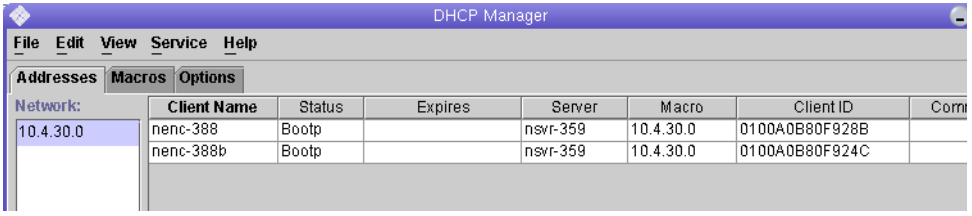
      `0100A0E80F924C`

b. **Toward the bottom of the window, select "Assign only to BOOTP clients."**



c. **Click OK.**

The DHCP manager updates the status and client ID, as shown in the following example:



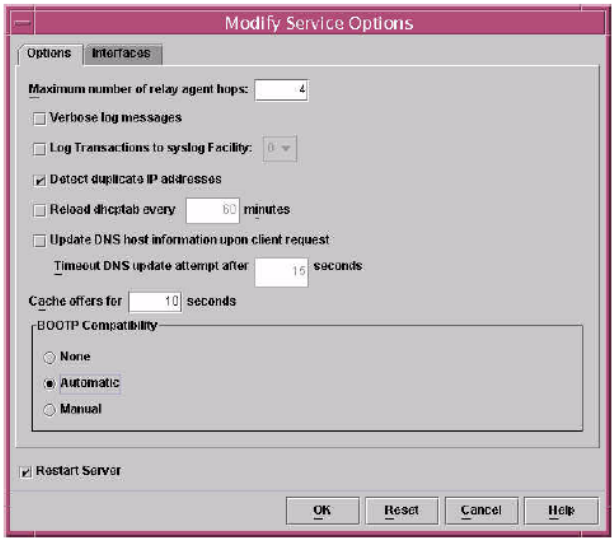
8. **Go to Modify Service Options and do the following:**

   a. **Select Detect Duplicate IP addresses.**

   b. **Under BOOTP Compatibility, select Automatic.**

   c. **Select Restart Server, as shown in the following example.**

.



d. Click OK.

After the configuration process has finished, the DHCP server provides BOOTP services to the MAC address you entered for each RAID controller.

9. **To verify that the BOOTP service is running, go to Service > Restart.**
10. **After you power on the array, ping the address.**

    If the ping responds with '`alive`', the DHCP server BOOTP operation was successful.

Setting Up a Windows 2000 Advanced Server

Before you begin, make sure the following requirements are met:

- Windows 2000 server and the array are on the same subnet.
- IP addresses that are assigned to the RAID controllers do not conflict.
- The array is in BOOTP IP addressing mode (the default setting for a new array).
- The Windows 2000 Server setup CD is available.

The following procedure provides an example of how to set up DHCP with the BOOTP option on the Windows 2000 Advanced Server. Your environment may require different steps.

Installing the DHCP Server

To install DHCP server on Windows 2000 Advanced Server:

1. **From the Control Panel, go to Administrative Tools > Configure Your Server.**
2. **Select DHCP from the Networking drop-down menu on the left.**

   The wizard instructs you to use the Windows Components wizard to add the DHCP component.
3. **Start the Windows Components wizard and double-click Networking Services.**
4. **Select Dynamic Host Configuration Protocol (DHCP), click the check box to its left, and click OK.**

   The Windows Components wizard is displayed.
5. **Click Next.**
6. **If Terminal Services Setup is displayed, select Remote administration mode. Click Next.**

   If your server has obtained an address from a DHCP server for its own address, a warning is displayed.
7. **Click OK to accept the warning.**

   Local Area Connection Properties is displayed.
8. **Assign a static IP address to the server, or click Server to keep DHCP addressing for the server. Click OK.**
9. **Click Finish to exit the Windows Components wizard.**

   The DHCP server is now installed. The next step is to configure the server.

Configuring the DHCP Server

To configure the DHCP server:

1. **From the Control Panel, go to Administrative Tools > Computer Management > Services and Application > DHCP.**

2. **From the Action menu, select New Scope.**

   The New Scope wizard is displayed.

3. **Enter the following information as prompted:**
   - Scope name and description:
   - IP address range (for example, `192.168.0.170` to `192.168.0.171`)
   - Subnet mask (for example, `255.255.255.0`)
   - Add exclusions (do not exclude any IP addresses)
   - Lease duration (accept the default of 8 days)
   - Router (default gateway) of your subnet (for example, `192.168.0.1`)
   - Domain name, WINS server (these are not needed)
   - Activate Scope? (select Yes, I want to activate this scope now)

4. **Click Finish to exit the wizard.**

   The contents of the DHCP server are listed.

5. **Right-click Scope [***ipaddress***] *scope-name* and select Properties.**

6. **In the Scope Properties box, click the Advanced tab.**

7. **Select BOOTP only, set the lease duration to Unlimited, and click OK.**

8. **Right-click Reservations.**

   The Controller A Properties box is displayed.

9. **Enter the IP address and the MAC address for Controller A. Click Add.**

   The Controller B Properties box is displayed.

10. **Enter the IP address and the MAC address for Controller B. Click Add.**

    The controllers are added to the right of the Reservations listing.

11. **Right-click Scope [***ipaddress***] *scope-name* to disable the scope.**

12. **Click Yes to confirm disabling of the scope.**

13. **Right-click Scope and select Activate.**

    The DHCP server is now configured with the BOOTP option for the array network.

14. **Power on or power cycle the array modules.**

15. **Click Address Leases in the left pane to check the DHCP server leases.**

    The lease expiration displays the following status for each RAID controller.

    `Reservation (active)`

    If the lease expiration for the controllers is inactive, try refreshing the list. If the lease is still inactive, check the following;

- Are the IP addresses allocated for BOOTP conflicting?
- Were the correct MAC addresses added to the DHCP server for the array controllers?
- Are the DHCP server and array on the same subnet?
- Is the gateway configured correctly on the DHCP server? The RAID controllers can gain a lease and an IP address, but they cannot respond out of the subnet for the software if the gateway is not configured properly.
- Are the RAID controllers set up for BOOTP access? It is possible that they were previously configured to have static IP addresses. You must be sure when you move an array that you change the array's IP addresses to IP addresses on the new subnet before setting up BOOTP services.

Glossary

agent A Storage Automated Diagnostic Environment program that runs on a management host, monitoring its storage elements and diagnosing any problems.

alarm A warning of an existing or approaching alert. See also event.

alert A subtype of an event that requires user intervention. The term *actionable event* often describes an alert. See also event.

array A disk subsystem, made up of multiple disk drives, that functions as a single large device. A high-availability (HA) array configuration has multiple controller and expansion trays of disk drives.

array hot spare A disk that serves as a hot spare within an array; a reserve disk that can be made available to all virtual disks within an array. See also hot spare.

block The amount of data sent or received by the host per I/O operation; the size of a data unit.

capacity The amount of storage you must allocate to storage elements, including volumes, pools, and virtual disks. Capacity planning should include allocations for volume snapshots and volume copies.

CLI Command-line interface. The SSCS command-line interface is available from the remote CLI client or through an SSCS directory on the Solaris Operating System management software station.

controller tray A tray with an installed redundant RAID controller pair. In a Sun StorEdge 6130 array, 1x1, 1x2, 1x3, and 1x8 array types are available.

control path The route used for communication of system management information, usually an out-of-band connection.

customer LAN See site LAN.

DAS See direct access storage (DAS).

data host Any host that uses the system for storage. A data host can be connected directly to the system (DAS) or can be connected to an external switch that supports multiple data hosts (SAN). See also host.

data path The route taken by a data packet between a data host and the storage device.

direct access storage (DAS) A storage architecture in which one or two hosts that access data are connected physically to a storage array.

disk A physical drive component that stores data.

event A notification of something that happened on a device. There are many types of events, and each type describes a separate occurrence. See also alarm and alert.

expansion tray A tray that does not have a RAID controller, used to expand the capacity of an array. This type of tray must be attached to a controller tray to function.

failover and recovery The process of changing the data path automatically to an alternate path.

fault coverage The percentage of faults detected against all possible faults or against all faults of a given type.

FC See Fibre Channel (FC).

Fibre Channel (FC) A 2-gigabit, bi-directional serial data-transfer protocol, deployed across a wide range of storage hardware and commonly used for storage area network (SAN) configurations.

Fibre Channel switch A networking device that can send packets directly to a port associated with a given network address in a Fibre Channel SAN. The Fibre Channel switches are used to expand the number of servers that can connect to a particular storage port. Each switch is managed by its own management software.

field-replaceable unit (FRU) An assembly component that is designed to be replaced on site, without the system having to be returned to the manufacturer for repair. Servicing FRUs is documented in the Service Advisor software.

FRU See field-replaceable unit (FRU).

HBA See host bus adapter (HBA).

host As a function of the Sun StorEdge 6130 array configuration, a host represents a data host and is mapped to initiators and volumes to create a storage domain. See also data host, initiator.

host bus adapter (HBA) A controller board on the server that allows the server to attach to external storage. See also initiator.

host group A group of hosts with common storage characteristics that can be mapped to volumes. See also host.

hot spare The drive used by a controller to replace a failed disk. See also array hot spare.

in-band traffic System management traffic that uses the data path between a host and a storage device. See also out-of-band traffic.

initiator On a Fibre Channel network, a host that requests transactions with storage elements. Each connection represents a separate initiator, so if a host is connected to the system through two HBAs, the system identifies two different initiators. Initiators can be grouped into host groups. Sun's MPxIO software provides a round-robin mode, where multiple HBAs are grouped together and the system identifies the group of HBAs as one initiator.

IOPS A measure of transaction speed, representing the number of input and output transactions per second.

LAN Local area network.

logical unit (LUN) The identifier for a volume as it is recognized by a particular host. The same volume can be represented by a different LUN to a different host.

LUN See logical unit (LUN).

MAC Address See media access control (MAC) address.

management host A Solaris host serving the configuration, management, and monitoring software for the Sun StorEdge 6130 array. The software on the station can be accessed with a browser to run the BI or with a remote thin-scripting client to access the SSCS CLI commands.

media access control (MAC) address The physical address identifying an Ethernet controller board. The MAC address, also called an Ethernet address, is set at the factory and must be mapped to the IP address of the device.

multipathing A design for redundancy that provides at least two physical paths to a target.

out-of-band traffic System management traffic outside of the primary data path that uses an Ethernet network. See also in-band traffic.

PDU See power distribution unit (PDU).

pool See storage pool.

power distribution unit (PDU) The assembly that provides power management for the system. The redundant design uses two PDUs in each system so that the system's data path continues to function if one of the PDUs fails.

profile See storage profile.

RAID Redundant array of independent disks. A configuration in which several drives are combined into a single virtual drive to improve performance and reliability. Also called a RAID set or a RAID group.

RAS Reliability, availability, and serviceability.

remote CLI client Also called the thin-scripting client, the remote CLI client runs the SSCS command-line interface on any qualified host in the network. The client communicates with the management software through a secure out-of-band interface, HTTPS.

The client must be installed on a host that has network access to the system. The available clients are for the Solaris, Microsoft Windows 2000 and Windows 2003, Linux, HP-UX, IBM AIX, SGI, and Novell operating environments.

remote monitoring Monitoring of the functions and performance of a hardware system from a location other than where the hardware resides.

remote support The remote management host uses Sun Remote Services Net Connect 3.1 software to communicate problems with Sun service.

SAN See storage area network (SAN).

site LAN The local area network at your site. When the system is connected to your LAN, the system can be managed through a browser from any host on the LAN.

snapshot A copy of a volume's data at a specific point in time.

SSCS Sun Storage Command System, the CLI that can be used to manage the array.

storage area network (SAN) An architecture in which the storage host are connected to each other to increase data availability and storage utilization.

Storage Automated Diagnostic Enviroment (StorADE) An automated fault management system (FMS) for SAN devices. The FMS provides health and telemetry for Sun SAN devices.

storage domain A storage partition created through the mapping of initiators to hosts and the mapping of volumes to hosts or host groups.

storage pool A collection of volumes with a common configuration, availability, and performance. You assign a profile to a pool to define the attributes of the pool.

storage profile A set of storage pool attributes that optimize the storage pool for a particular access pattern and level of data protection. You assign a profile to a pool to define the attributes of the pool.

storage tray An enclosure containing disks. A tray with dual RAID controllers is called a controller tray; a tray without a controller is called an expansion tray.

stripe size The total amount of data in a stripe, representing the block size multiplied by the number of disks in the stripe. See also striping.

striping A storage allocation method in which data is stored over a series of disks or virtual disks, improving performance.

target The recipient of initiator commands, usually a volume.

thin-scripting client See remote CLI client.

tray See storage tray.

virtual disk A collection of physical disks that share a RAID level and disk type (FC or SATA). Virtual disks are created as a result of an option during the development of a volume.

volume A container in which applications, databases, and file systems store data. Volumes are created from virtual disks, based on the characteristics of a storage pool. A volume is seen by a Data Host as a single disk.

volume snapshot See snapshot.

WWN World Wide Name. A unique 64-bit number assigned by a recognized naming authority such as the IEEE that identifies a connection (device) or a set of connections to the network. The WWN is constructed from the number that identifies the naming authority, the number that identifies the manufacturer, and a unique number for the specific connection.

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